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SCHEDULE OF MEETINGS

7-25 May	**Tenth World Health Assembly, Geneva**
27-31 May *	**Twentieth session of the Executive Board, Geneva**
12-15 June	**Sub-Committee on Non-Proprietary Names of the Expert Committee of the International Pharmacopoeia, Geneva**
17-24 June	**FAO/WHO Expert Committee on Food Additives, Geneva**
24-28 June	**Study Group on Histological Definitions of Cancer Types, Oslo**
27 June-5 July	**Conference on Health Education of the Public, Wiesbaden**
15-20 July	**Expert Committee on Poliomyelitis, Geneva**
25-31 July	**Technical Conference on Insect Resistance, Geneva**
2-6 September	**Expert Committee on the Public Health Aspects of Water Fluoridation, Geneva**

* Approximate date

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SEARCH FOR A LIVE ANTIPOLIOMYELITIS VIRUS VACCINE

Vaccination against poliomyelitis is one of the subjects with which WHO has been actively concerned for several years. At the end of 1955, a number of experts convened by WHO discussed the various aspects of this problem and formulated technical opinions [1] to which the health authorities of many countries have frequently referred. At present, WHO is encouraging research in this field in various ways. Studies carried out in Northern Ireland (with the financial support of the National Fund for Poliomyelitis Research, the Medical Research Council and WHO) on the application of attenuated live virus vaccine have recently been described.[2] Others have been published in the United States of America.[3, 4] Dr A. M.-M. Payne summarizes the conclusions reached in these studies in a note which will appear shortly in the *Bulletin of the World Health Organization*,[5] from which the following is taken.

* * *

The application on a relatively large scale of an antipoliomyelitis vaccine based on virus inactivated with formalin—the Salk vaccine—marks an advance in public health measures. By means of this vaccine we are able to exercise some control over a dreaded disease, which is increasing in frequency over a large part of the world.

However, it cannot yet be claimed that poliomyelitis has been conquered. The vaccine prevents paralysis in a large proportion of cases, but not in all ; the duration of immunity is still unknown, and reinforcing injections may be needed at intervals throughout life. Moreover, some authorities consider that it is desirable for immunity to be maintained by constant contact with inapparent infection prevalent in the environment. However, in economically advanced communities this asymptomatic natural infection can hardly be relied upon for reinforcing vaccinal immunity, since the infection itself is becoming less widespread although clinical disease more often results. Furthermore, the preparation of inactivated virus vaccine involves technical difficulties, it is costly, and the vaccine must be administered by injection.

Theoretically, an attenuated live virus vaccine administered orally would overcome some of these drawbacks. It should confer the same immunity as that given by natural infection without the accompanying risk of paralysis. Many workers are now endeavouring to perfect a vaccine of this type. They have shown that a virus vaccine of diminished virulence for the monkey, when administered to man orally, can promote the formation of antibody without the accompaniment of any appreciable disease symptoms in the person vaccinated. We must now establish which strain could be used in practice, and many problems arise here. As is known, attenuation is not an all-or-none property of the polioviruses ; on the contrary, different strains exhibit a whole range of virulence. Their activity may vary from high neurotropism, manifested by paralytic symptoms in chimpanzees fed with the virus, to maximum attenuation, shown by the absence of paralytic symptoms in chimpanzees inoculated intraspinally with the virus—this procedure representing the most severe form of exposure.

It has been found that man is more susceptible than the chimpanzee and monkeys to alimentary infection with poliovirus administered orally, while it is believed that he is the least susceptible of these primates to infection of the central nervous system. Moreover, an experimental vaccine which

[1] *Wld Hlth Org. techn. Rep. Ser.* 1956, **101**
[2] Dick, G. W. A. et al. (1957) *Brit. med. J.* **1**, 59, 65, 70
[3] Sabin, A. B. (1956) *J. Amer. med. Ass.* **162**, 1589
[4] Koprowski, H. et al. (1956) *J. Amer. med. Ass.* **160**, 954
[5] Payne, A. M.-M. (1957) *Bull. Wld Hlth Org.* (in press)

fails to paralyse the lower primates by intracerebral inoculation, and which produces paralysis in them only when injected intraspinally in large doses, will not paralyse the chimpanzee whatever the route of inoculation. It is very likely that the same holds true for man, and that the attenuated virus taken orally will not affect the nervous system, although giving rise to an immunizing asymptomatic infection in the digestive tract. Poliovirus strains capable of conferring immunity in this way exist. It might therefore be thought that a live virus vaccine is already available; before such a vaccine could be used, however, many difficulties remain to be solved.

Live virus vaccine problems

The poliovirus, like most viruses, produces a certain number of variants; the very fact that attenuated viruses exist proves this. Thus, when investigating the value of an attenuated virus for immunization, one must be sure that it will not revert to the virulent state, and that, if some particles are more virulent than others, they will not outgrow the attenuated particles in the digestive tract.

The studies in Northern Ireland already referred to were carried out with two strains of attenuated virus. The first, a type 2 virus, was administered to adults, children and infants; in most, but not all, it brought about the formation of antibody; the immunized persons excreted the virus in the faeces during a month or more. The excreted viruses, unlike the vaccine from which they came, were cytopathogenic in tissue culture and virulent for monkeys when inoculated intracerebrally. This strain was consequently considered to be unsuitable for vaccination in its present form. The second attenuated strain used was a type 1 virus. The formation of antibody was observed in all persons fed, no significant morbid symptoms appeared, and the virus was excreted in the faeces. In some instances the excreted virus appeared rather more virulent than the vaccine virus. This strain has the advantage over the preceding one of being cytopathogenic, so that it can be obtained as a pure strain from a single particle by Dulbecco & Vogt's method. The virus used in these studies had not been purified in this way. Further studies of this strain using purified material are proceeding.

The problem of " contagion " must also be considered. It is known that under unsatisfactory hygiene conditions, the virus excreted in the faeces of persons vaccinated with live virus can pass to non-vaccinated people; furthermore, an increase in virulence of the virus after repeated passage cannot be excluded, since the degree of stability which can be expected in an attenuated virus has not yet been established.

Altogether, many problems remain to be solved before the use of an attenuated live virus vaccine which is safe for the individual can be extended to the whole community. Studies are continuing with the aim of administering the attenuated experimental virus vaccine to larger and larger groups, in order to develop methods of confirming its harmlessness and assessing its effectiveness.

Report on poliomyelitis vaccination

The report of a WHO-convened group of internationally known scientists who met, in November 1955, to consider the state of poliomyelitis vaccination (see *Chronicle of the World Health Organization*, 1956, **10**, 3) has been published as No. 101 of the *Technical Report Series*. This report, although it is termed a " preliminary review " of its subject, provides an authoritative opinion on one of the most promising of recent developments in disease prevention.

MALARIA CONTROL MEASURES IN AFRICA

If malaria is to be eliminated as a serious public health problem in Africa one prerequisite is the supply of additional information on the hyperendemic and the holoendemic areas. However, before elimination can be considered, control must be effective and to achieve full success for the present malaria control programmes inter-country co-operation will soon become necessary. These views met with the general agreement of the 25 malariologists, entomologists, and public health officers from all parts of South and East Africa who were present at the WHO-sponsored technical meeting on malaria which was held in Nairobi, Kenya, in November 1956. This meeting, which had been convened by WHO's Regional Office for Africa, was the first of its kind to be held in East Africa and to deal with the practical details of malaria control.

The Report of the meeting contains a good illustration, in the remarks made by the Director of the Medical Services of Kenya, of the changing pattern of malaria control in Africa. He said: " Malaria has, throughout the comparatively short history of Southern Africa, been one of the major scourges of these territories and has often seriously retarded development in the region. Much progress has been made over the last quarter of a century, both in the application of control measures and in improved methods of treatment. The progress which has been made in reducing the ravages of malaria is shown most dramatically in the reduction . . . of that important sequel to malaria infection, blackwater fever, which formerly took such a grave toll particularly of the migrant races to Africa. Blackwater has now become rare, so much so that many medical practitioners in this country have never seen a case."

Country-wide control difficulties

Although considerable progress has been made, nevertheless there are many difficulties which still lie in the way before country-wide malaria control can be achieved in tropical East Africa. The Nairobi meeting provided a valuable forum for discussion of questions such as the resistance of vector anophelines to chlorinated hydrocarbon insecticides and the sorption of insecticides by mud walls, and also for the consideration of many technical and administrative factors relating to the present status of malaria control campaigns in the territories represented.

In view of the importance of *Anopheles gambiae* as a malaria vector in Africa and the difficulties encountered in achieving complete interruption of transmission in equatorial areas, the World Health Organization has set up an advisory and research team which will be put at the disposal of governments for the study of the genetics and the biology of the species.

Status of malaria control in South and East Africa

During the discussion on the status of malaria control programmes a number of new and significant facts were presented by the representatives from the various States and territories.

Swaziland

One hundred and thirty thousand people out of a total population of 231 000 live in potentially malarious areas. After ten years of antimalaria work the general parasite rate had, by 1956, dropped to 0.7% while the infant parasite rate has been at zero for the past two years. It has proved possible to discontinue control operations in some areas but surveillance is continuing.

Zanzibar

The entire population of 265 000 live in malarious areas. Good antilarval work has

been carried out in the main towns for the last twenty years and the town of Zanzibar itself is now considered malaria free. A new territory-wide control programme, assisted by WHO and UNICEF, will shortly commence operations.

Mauritius

The island-wide residual spraying campaign has mastered malaria and has eradicated one of the vectors, *A. funestus*. Some *A. gambiae* breeds along the coast but it is apparently a poor vector. In 1955 there were only 34 malaria cases, many of which may have been relapses.

Kenya

Four million two hundred thousand out of a total population of 5 ½ million live in malarious areas. The situation is complicated by the existence of hyper- and holoendemic malaria in the lowlands and seasonal epidemic malaria in the highlands. Control measures have so far been confined mostly to urban and highland areas. Residual spraying in coastal towns has given good results in the control of *A. gambiae* and in the Nandi district epidemic malaria has not occurred since the application, first, of chemotherapeutic measures consisting of a single dose of pyremethamine to the whole population, and, later, of residual spraying of dieldrin.

Tanganyika

Two-thirds of the total population of 9½ million live in malarious areas. Control measures have been confined to urban areas and larger settlements. They have consisted mostly of antilarval work. The East Africa High Commission's pilot project in the Pare-Taveta area is of special interest. Its objectives are to test the possibility of stopping malaria transmission by residual insecticide (dieldrin) spraying and to assess the effects of freedom from malaria. Results have been encouraging and there have been significant reductions in malariometric rates.

Somaliland Protectorate

Of the total population of 640 000 it is estimated that 90% is nomadic. The majority of the inhabitants spend six months of the year outside the country in areas subject to seasonal epidemics of malaria. In Somaliland itself there are few areas where permanent water is found but, where it is, *A. gambiae* breeds all the year round and maintains a low constant endemicity. BHC residual spraying has reduced spleen rates from 25% to zero in these foci. A control programme, assisted by WHO and UNICEF, to cover the area of seasonal epidemicity in the Haud is planned.

Ethiopia

Five to seven million people out of a total population of 15 million live in malarious areas. Pilot projects assisted by the United States International Co-operation Administration and by WHO were started recently and it is hoped that control will be extended to wide areas in the future.

Ruanda Urundi

Three-quarters of the population of 4½ million live in malarious areas. Control work has been under way since 1949 and now covers all areas up to an altitude of 2000 metres. The infant parasite rate in the plains has been reduced from 48% to 13%.

Mozambique

Malaria exists in meso- or hyperendemic form throughout the territory. Control work is carried out in all large centres and in irrigated areas. Lourenço Marques can be considered as malaria free. Antilarval work is done in towns but residual insecticide spraying is used in the surrounding areas.

Southern Rhodesia

Malaria remains well under control. Antimalarial operations were started in 1949. DDT was used in the first year and after that BHC. In the 1955/56 season, the central

plateau area with a population of 1½ million was left untreated and an area with a population of one million around the periphery was treated. In the present season chemotherapeutics were also used in this peripheral area.

Union of South Africa

Antimalaria work was originally started in 1922 and has resulted in the interruption of transmission over large areas. Steps to effect complete eradication of malaria are now contemplated. Measures now used include residual spraying with DDT and BHC and antilarval work with DDT emulsion. A system of tracing every malaria case is in force.

Madagascar

The population of five million is protected by residual insecticide spraying combined with chemotherapeutics administered to all children up to the age of 15. Results on the high plateau and on the west coast have been excellent, though on the east coast where there is a long transmission season some transmission still takes place.

Technical hazards

The Nairobi meeting considered some of the technical hazards which hampered effective malaria control in Africa. One problem was the sorbent capacity of different types of wall surfaces. It had been found that where walls were made of a mixture of materials, some of which were non-sorbent, the effect of the insecticide was likely to remain for longer periods. Work was in progress to formulate an insecticide in such a way that sorption would be greatly reduced. Should this be successful normal dosages of insecticide would be effective even on sorbent surfaces.

Another environmental factor which was the cause of some concern was the operation and in some cases the extension of large-scale irrigation schemes which contributed to the spread of malaria. It appeared that the control of mosquitos in irrigated areas by standard methods tended to be less successful than under other conditions. In view of these control difficulties the meeting felt that irrigation schemes required the special attention of all authorities concerned.

In regard to vector control the consequences of residual insecticide spraying in areas where both *A. gambiae* and *A. funestus* were found received careful consideration. It has already been shown that *A. funestus* is virtually eliminated by spraying, but although there is a great reduction in house-resting *A. gambiae* adults the species can still be found breeding out-of-doors. A good example of this occurred in Mauritius where, although *A. funestus* has been eliminated, *A. gambiae* remains along the coastal areas, where it is breeding freely. However, it is found mostly in the open and appears to be a poor vector.

Although no morphological difference has been found between the outdoor-resting and the indoor-resting *A. gambiae*, it is still impossible to say whether they are genetically distinct strains. In Southern Rhodesia 1000 female *A. gambiae*, caught out-of-doors in a sprayed area, were dissected but no infected specimens were found. The meeting was of the opinion that more work was required on the feeding habits and the vectorial role of the outdoor-resting *A. gambiae*.

During the course of discussion references were made to large-scale infestations of flies following dieldrin applications. Although it was possible that in some cases the infestation was more apparent than real, nevertheless the meeting thought that it would be valuable in new antimalaria projects to include a fly survey as part of the pre-operational survey.

Interesting figures were put before the meeting of the efficacy of one annual spraying with dieldrin. Single hut experiments were described and these showed that the application of a nozzle dosage of 1.0 g/m² gave a very high kill for six months on sorbent surfaces, and for up to 18 months on non-sorbent. With a nozzle dosage of 0.5 g/m² on less sorbent surfaces the effective period was six months.

Larval control was not considered as practicable in most rural areas in Africa, although it had been found to be effective in the Union of South Africa. Larvicidal measures have however been widely used in African towns, mainly for pest mosquito control.

In considering the use of drugs as a method of control for mass application, pyrimethamine in a single dose was thought to be effective in the arrest of epidemic malaria. However, examples were given of resistance of *P. falciparum* where repeated doses were administered. An interesting side-effect resulting from the administration of pyrimethamine to nursing mothers was that by reason of its appearance in human milk a suckling infant could absorb even more than the appropriate therapeutic dose. Observations had shown that the administration of chloroquine or amodiaquine combined with primaquine caused the complete abolition of parasitaemia.

Future possibilities

Viewing the possibilities of effective malaria control in Africa the meeting adopted an attitude of cautious optimism. It was, for example, thought to be questionable that country-wide control was possible where there were large areas of hyperendemic or holoendemic malaria. In South Africa campaigns had been carried out with great success. In West Africa the data available some years after control measures had been started showed that nowhere had there been complete interruption of transmission. In East Africa there was preliminary evidence to indicate that the Pare-Taveta scheme in Tanganyika, mentioned elsewhere in this article, might be successful.

ERADICATION OF MALARIA IN SOUTH-EAST EUROPE

Antimalaria campaigns, aimed at eradication, have been intensified in south-east Europe, with the following countries participating: Albania, Bulgaria, Greece, Romania, Turkey, the USSR, and Yugoslavia. Representatives of these countries attended a Conference, which was held in Belgrade from 26 to 29 March 1957 under the joint auspices of the WHO Regional Office for Europe and the Yugoslav Government. They noted the progress made since the last meeting, in 1955,[1] and discussed ways of attaining still closer collaboration between their respective countries, in order to reach the final goal in the near future.

Despite the fact that malaria is receding in all the countries of this area as a result of the campaigns, the time has not yet come to relax efforts; indeed, as the Conference participants felt, the indifference shown by health services and the population as a whole to a problem which they no longer consider acute is a harmful attitude, since the resistance it creates is difficult to overcome. The public—and occasionally the authorities—are inclined to lose interest in a disease which, although it has not completely disappeared, no longer causes the same suffering. One of the aims of the Conference was to highlight those questions still awaiting solution and to stress the need for speedy and energetic action in a spirit of full collaboration.

The following data give an idea of the progress made:

Albania (population: 1.26 million). In 1956, 751 cases were found (1221 cases had been confirmed during the first 10 months of 1955). On the basis of the examination of 30 000 children, the spleen rate was found to be 4.4%, and the parasite rate, 0.01%. Cases are treated with mepacrine and plasmocide. At certain work-sites in marshy

[1] See *Chron. Wld Hlth Org.*, 1956, 10, 73.

areas, houses are sprayed with DDT and use is made of chemoprophylaxis. Spraying has been carried out not only where cases appear but also in places where the danger of infection seems probable.

Bulgaria (population: 7.5 million). Only 261 cases were reported in 1956 (as against 662 during the first 10 months of 1955). Of these, 186 were new cases and 75 were relapses. Case notification is compulsory, as is hospitalization of sufferers and follow-up in a clinic for three years. Anti-relapse treatment in the spring and chemoprophylaxis have now become routine methods. The bipartite agreement with Romania has been helpful to Bulgaria, and the tripartite agreement concluded with Greece and Yugoslavia justifies the hope that the few cases observed in the frontier areas will soon disappear.

Greece (population: 7.9 million). In 1956 the prevalence of the disease reached the lowest level ever recorded. Nevertheless, the figure of 680 confirmed cases is misleading and should be multiplied by four to give a rather more realistic picture. Fifteen of the 50 prefectures were free from the disease. The distribution of cases is sporadic (2.3 cases per positive locality). Sixty per cent. of the cases occurred in the 0-15 year age-group. The parasite rate among school-age children was 0.02%, and among infants it was zero.

Romania[2] (population : 17.15 million). In 1956, 259 malaria cases (189 confirmed) were reported in 92 localities with a total population of 786 000 ; 74 of these cases were relapses. Insecticides are applied by spraying the whole area, by treating foci, or by barrier spraying. Schizonto-gametocidal treatment is administered for two years during the transmission period. The notification of malaria cases by name of patient has been in force since 1956.

Turkey (population : 22.9 million). A draft bill on malaria eradication has been submitted to parliament. As malaria was not a notifiable disease in 1956, no exact figure for the number of cases can be given. More than 200 doctors and 1330 public health workers are engaged in malaria control. About 7 million persons were protected by insecticide spraying in 1956. Malaria is no longer a public health problem, but its eradication is considered essential and is, indeed, the aim of the 1957 programme.

Union of Soviet Socialist Republics (population: 214.5 million). The prevalence of malaria has decreased steadily since the end of the Second World War, when the annual number of cases was estimated to be more than 4 million. From 781 000 in 1951 this figure fell to about 12 600 in 1956. The few residual foci are situated principally in Azerbaijan, Tadzhikistan, Kazakhstan, Uzbekistan, and Transcaucasia.

Treatment is compulsory and the patient is followed up at a clinic for two years. In the spring he is subjected to anti-relapse treatment and during the transmission season schizonto-gametocidal drugs are administered twice weekly. Only a few regions are covered completely by insecticide spraying. Towns situated on the banks of rivers are protected by barrier-spraying, and in sporadic cases selected foci (the patient's home and neighbouring houses) are sprayed. In areas where the silkworm is cultivated, the walls of houses are left unsprayed, but domestic animals are treated fortnightly, since the anopheline vectors are essentially zoophilic. Prophylactic treatment is administered to gangs of workmen engaged in the construction of hydroelectric installations, in particular along the Volga. In areas where such work is being undertaken, the population is systematically examined and the cases found are treated. In this way, sources of infection are eliminated before the artificial lakes are filled with water.

The delegation of the USSR informed the Conference participants that a new drug—"Chinocide"—, derived from the 8-aminoquinolines and acting on the exoerythrocytic phase of *Plasmodium vivax*, had just been

[2] See Ciuca, A. (1956) *Bull. Wld Hlth Org.*, 15, 725, for a detailed report on malaria in Romania from 1949 to 1955.

applied with success ; it considerably reduces the relapse rate. A certain quantity of this drug has been made available to countries which may wish to carry out therapeutic trials.

Yugoslavia [3] (population: 17.27 million). The main foci still existing are in Macedonia and the oblast of Kosmet. As the vectors have not yet acquired resistance to DDT, eradication seems possible in the near future. Since 1955, notification of cases has been compulsory. Treatment of sufferers, which is free, is also compulsory. However, chemotherapy is only of secondary importance; in the interests of eradication, greater emphasis is placed on imagicidal treatment.

Epidemiological surveillance

The task of an epidemiological surveillance unit is to carry out careful surveys for the detection, confirmation and treatment of cases. Experience has shown, in fact, that compulsory notification of cases and examinations in hospitals and clinics, as well as those carried out by private practitioners and laboratories, give only an approximate idea of the prevalence of malaria in a country, except perhaps when the rural health services are very well developed. To be effective, inspection must be made from village to village, and from house to house. The members of the inspection team take blood samples and, after microscopic examination, administer drugs where necessary. The role of clinics and medical practitioners consists in following up the patients treated. On the average, visits by surveillance personnel should take place three times monthly. Short-term schedules are particularly indicated. The Conference noted with great interest the results of recent experiments, which show that a single dose of pyrimethamine will remain in the blood for as long as 52 days, in a concentration sufficient to prevent the further development of the parasites in the body of the mosquito. This discovery, if confirmed, would be of the utmost value in eradication campaigns.

When eradication measures have reached a stage where only a few foci remain—a stage for which provision should be made from the outset—it is essential to have available insecticides of tested quality and to employ a scrupulously supervised and careful technique.

The elimination of residual foci by means of case-finding may meet with certain difficulties. For example, malaria may persist, undetected, in mountain villages. Generally speaking, this is the benign tertian form, a non-fatal infection in which relapses are rare. Since the parasite rate is very low, haematological diagnosis can be established with certainty only by repeated thick-film examination. Furthermore, access to such foci may be difficult, and examination on the spot, as well as the distribution of drugs, less easy than in the plains. Seasonal movements of the population in these mountainous areas may complicate the problem still further.

Economic repercussions of eradication

Before the gradual disappearance of malaria as a public health problem countries in south-east Europe suffered grave economic as well as social losses through the disease. The following examples provide good illustrations:

In 1936, the Yugoslav national economy lost nearly 8 million dinars solely on account of malaria. And this figure does not include the potential economic value of human lives lost to the country's economy, owing to the effects of malaria on the birth rate.

Before the start of the antimalaria campaign, Greece consumed annually one-fifth of world quinine production. The sum spent every year was one-and-a-half times greater than the annual cost of the present eradication campaign. Moreover, if economic losses are taken into account, the annual expenditure was eighty times greater.

[3] See Simič, Č. [& Richter, B.] (1956) *Bull. Wld Hlth Org.*, **15**, 753, for a detailed article on malaria in Yugoslavia.

Susceptibility of the vectors

So far none of the countries of south-east Europe, apart from Greece, has had to face the problem of the resistance of vectors to residual insecticides.

It has been suggested that the data collected in the different countries on the " basic susceptibility " of the different vectors to the various insecticides should be centralized, if possible under the auspices of WHO. These data, which should be established by a uniform method—the Busvine-Nash technique—and expressed in lethal concentrations (LC_{50}) would make it possible to detect any change in the susceptibility of the vectors to insecticides. A standard method for the evaluation of resistance is being worked out under the direction of WHO.

Conclusions

All the countries represented at the Conference have made considerable progress towards malaria eradication, and the final goal seems likely to be attained within a limited time and under financial conditions acceptable to all the countries concerned. The Conference recommended each delegation to study suggestions concerning the maintenance by WHO of a central register of information containing material of interest to the health administrations of countries wishing to eradicate malaria in their territories. Such a register might include: a list of districts from which malaria has disappeared; a list of those which are not yet free of the disease and from which it might be introduced into healthy areas as a result of the migration of population groups; the presence of vectors, their geographical distribution and their susceptibility to insecticides; the presence of vectors—possibly resistant strains—near international airports.

The Conference expressed the wish that WHO, through its Regional Office for Europe, should undertake the work of co-ordination and exchange of information entailed in the carrying out of these suggestions.

Furthermore, an appeal was made to the spirit of inter-country co-operation to ensure that the common aim of eradication is achieved by all the participating countries within approximately the same time, i.e., from 3 to 5 years. An unfortunate situation would indeed be created if countries which had managed to eradicate malaria in their own territories were obliged to continue control measures for several years in order to prevent re-infection from their neighbour states, where endemic foci were still present. In this connexion, it was suggested that bilateral agreements should be reached between countries—if such arrangements were not already in existence—and that direct contact should be established so that close collaboration could be maintained between neighbouring states.

Malaria

Nation-wide malaria eradication programmes can be successful only if the resources of the health administrations are fully mobilized and established time schedules are scrupulously observed. The advisory services of WHO have been increasingly geared to the task of helping countries to find the most efficient and the most economical patterns for their eradication work; but it must be kept in mind that the Organization's contribution in providing guidance and advice will be useful only if the governments concerned ensure that the carefully planned programmes are implemented in a smooth and precise way.

. . . from the introduction to the *Annual Report of the Director-General* for 1956.

BCG VACCINATION PROGRAMMES, 1951-56 *

The WHO/UNICEF BCG vaccination programmes, which were started in 1951, represent a world-wide effort to combat tuberculosis. Within their framework countries in three continents have been assisted in carrying out mass BCG vaccination campaigns in accordance with a uniform pattern.

The campaigns are joint undertakings of the governments concerned, WHO and UNICEF: the responsibility for conducting the campaigns rests with the governments, who also provide the field personnel; WHO provides technical guidance, assigning international staff to assist in organizing the work and to train national personnel; UNICEF provides financial support, including equipment and supplies for the campaigns.

In all campaigns a single intradermal tuberculin test with 5 TU is used to select persons for vaccination. The test is read at 3-4 days and those persons reacting with less than 5 mm of induration (in some countries, 6 mm) are classified as non-reactors and vaccinated by the intradermal route. For testing, a single tuberculin product is used; [1] vaccine, on the other hand, is provided by different WHO-approved BCG production laboratories.[2]

The results are recorded and tabulated in accordance with standard procedures laid down by the WHO Tuberculosis Research Office. The tabulations, like the campaign operations, follow the administrative divisions of the countries. They include the total number of tests given, tests read, negatives, and vaccinations in the three age-groups 0-6 years, 7-14 years, and 15 years and over; in some countries, four age-groups are used—namely, 0-6 years, 7-14 years, 15-19 years, and 20 years and over. Monthly statistical tabulations are prepared by the campaign headquarters and forwarded to the WHO Tuberculosis Research Office; they form the basis of the statistical documentation of the programme.

Statistical reports of the work done up to the end of 1953 and 1954, respectively, have been published previously.[3, 4] The present report brings the statistics forward to the end of 1956.

Up to 1 January 1957 WHO and UNICEF have assisted the governments of 38 countries and territories, with a combined population of about 775 million, in carrying out BCG vaccination campaigns, and, altogether, 162 million people have been tuberculin-tested and 60 million vaccinated. From 1952 to the end of 1955 there has been a steady increase in the annual number of tests and vaccinations; during 1952, the first entire calendar year of the programmes, 14 million people were tested and 5 million vaccinated, while the corresponding figures for 1953 were 25 million and 9 million, for 1954, 37 million and 13 million and for 1955, 44 million and 17 million. In 1956, however, the number of tests dropped to 38 million and that of vaccinations, to 14 million.

Fig. 1 shows the progress of the programmes, month by month. The monthly figures reached a peak at the end of 1954, with 4.4 million tests and 1.6 million vaccinations. During the first quarter of 1955 the figures dropped to about 3.5 million tests and 1.3 million vaccinations. This level was maintained

* Material included in this report was compiled from monthly statistical tabulations sent to the WHO Tuberculosis Research Office from the various BCG campaigns. The data were processed and analysed and the report was prepared by Hans Christensen.

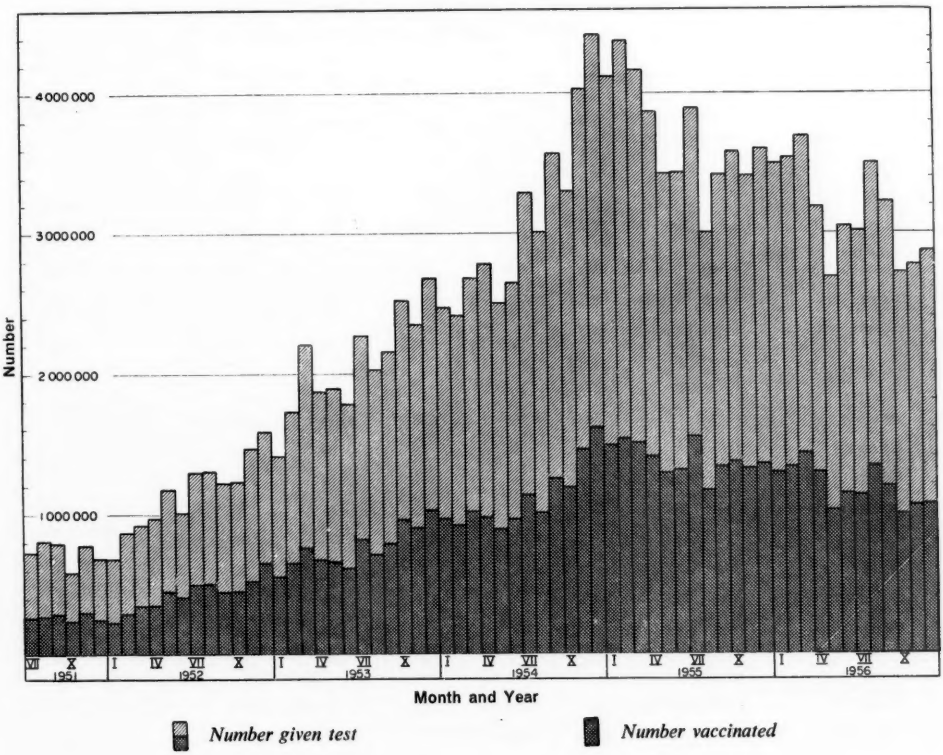
[1] PPD lot No. RT XXII prepared at the Statens Seruminstitut, Copenhagen.

[2] Central Institute of Hygiene, Ankara; Thai BCG Production Laboratory, Bangkok; Agouza Serum and Vaccine Institute, Cairo; Statens Seruminstitut, Copenhagen; Laboratorio del BCG, Guayaquil; BCG Production Laboratory, Karachi; King Institute of Preventive Medicine, Madras; Laboratorio del BCG, Mexico City; Institut Pasteur, Paris; Alabang Serum and Vaccine Laboratories, Rizal; Institut Pasteur, Saigon; Laboratorio del BCG, Santiago de Chile; BCG Laboratory, Provincial Serum and Vaccine Institute, Taipei; Institut Pasteur de l'Iran, Teheran.

[3] *Bull. Wld Hlth Org.*, 1955, **12**, 301

[4] *Chron. Wld Hlth Org.*, 1956, **10**, 126

FIG. 1. NUMBER OF PERSONS TUBERCULIN-TESTED AND VACCINATED WITH BCG IN WHO/UNICEF-ASSISTED CAMPAIGNS, BY MONTH, 1951-56



until the second quarter of 1956, when there was a further decline, the number of tests falling to less than 3 million and the number of vaccinations to 1 million by the end of the year. This reduction reflects the fact that many of the large campaigns in Asia reached a maximum in 1954.

Table I gives breakdowns by continent and country of the number of persons tuberculin-tested and BCG-vaccinated in the programmes by the end of 1956.

By far the largest part of the work has been carried out in Asia. In this continent almost 151 million people have been tested in 21 campaigns, compared with only 8.2 million in the 13 campaigns in America and 3.2 million in the four campaigns in Africa. Thus the campaigns in the populous countries of Asia account for about 93% of the total of 162 million persons tested, the Indian campaign alone accounting for 49%, the Pakistan campaign for 12% and the other 19 Asian campaigns for a further 32%. The comparatively very small scale of the American campaigns is due to the fact that they were conducted in small or thinly populated countries. The only exception is the Colombian campaign, which accounts for about 58% of the total tested in this continent.

TABLE I. NUMBER OF PERSONS TUBERCULIN-TESTED AND VACCINATED WITH BCG, COVERAGE IN AGE-GROUP 0-14 YEARS, AND PERCENTAGE POSITIVE IN AGE-GROUP 7-14 YEARS, BY COUNTRY, 1951-56

Country	Campaign period	Number of persons in thousands				Coverage[a] of age-group 0-14 years (%)	Percentage positive in age-group 7-14 years
		given test	with test read		vaccinated		
			total	negative			
Africa		*3 282*	*243*	*1 115*	*1 109*		
Egypt [b]	July 1951–Dec. 1952	2 269	1 476	654	649	18 [c]	33 [c]
Ethiopia & Eritrea, Federation of	May 1953–Dec. 1955	609	461	295	294	4	29
Libya	Feb. 1953–Dec. 1955	318	236	133	133	34	37
Sudan	April 1954–March 1955 Dec. 1956–	86	70	33	33	.	43
America		*8 253*	*7 628*	*4 695*	*4 682*		
Barbados	..	81	72	39	39	.	47
British Guiana	March 1954–July 1955	208	192	111	111	65	35
British Honduras	Sept. 1953–April 1954	48	46	23	23	75	30
Colombia	Sept. 1954–	4 752	4 414	2 770	2 767	.	22
Costa Rica	March 1952–July 1954	263	248	198	195	44	13
El Salvador	Aug. 1951–Nov. 1952	349	312	183	179 [d]	21	24
Guatemala	July 1956–	695	632	319	320	.	21
Jamaica	Oct. 1951–July 1953	635	586	349	348	52	18
Leeward Islands, St. Kitts [e]	Nov. 1953–Jan. 1954	24	23	9	9	83	. [e]
Paraguay [f]	Aug. 1954–	692	629	387	384	.	32

. = not applicable

.. = data not available

[a] Coverage is defined as the number of tests read in the age-group 0-14 years as a percentage of the general population in the same age-group. The general population 0-14 years of age is estimated by applying the age-distribution for the entire country to the population figures for each subdivision at latest census and raising the resulting estimates by the percentage increase of the total population from the census to the mid-year nearest to the mid-point of the campaigns. The data are obtained primarily from the United Nations Demographic Yearbooks.

[b] Before July 1951 the following work had been carried out by the International Tuberculosis Campaign: Egypt: 2 104 311 tests given, 661 128 vaccinations; Ceylon: 306 707 tests given, 122 764 vaccinations; India: 4 129 570 tests given, 1 372 029 vaccinations; Pakistan: 923 342 tests given, 294 598 vaccinations. In Ceylon, furthermore, 827 516 persons were tested and 418 851 vaccinated under Government auspices between July 1951 and May 1954.

[c] Based on results from the total campaign, including the ITC programme

[d] The figures include some persons vaccinated without previous test.

[e] The data include testing and vaccination of some persons already tested and vaccinated in an earlier BCG vaccination campaign; the percentage of positives cannot therefore be taken as an index of the prevalence of naturally acquired tuberculin sensitivity.

[f] Totals as of 31 December 1955

[g] Totals as of 31 August 1956

[h] The data include retesting and revaccination of some persons; the percentage of positives has been calculated on the basis of limited material excluding such data.

TABLE I. NUMBER OF PERSONS TUBERCULIN-TESTED AND VACCINATED WITH BCG, COVERAGE IN AGE-GROUP 0-14 YEARS, AND PERCENTAGE POSITIVE IN AGE-GROUP 7-14 YEARS, BY COUNTRY, 1951-56 *(concl.)*

Country	Campaign period	Number of persons in thousands				Coverage[a] of age-group 0-14 years (%)	Percentage positive in age-group 7-14 years
		given test	with test read		vaccinated		
			total	negative			
America *(continued)*							
Surinam [g]	Dec. 1955–	108	95	55	55	.	30
Trinidad & Tobago	April 1952–May 1954	338	321	212	212	78	24
Windward Islands, Grenada	Jan.–April 1954	60	58	40	40	78	16
Asia		*150 825*	*122 275*	*54 947*	*54 431*		
Aden Colony [g]	Feb.–May 1952 Jan. 1956–	42	31	11	11	.	53
Brunei	Sept. 1952–Dec. 1953	33	28	10	10 [d]	60	48
Burma	Dec. 1951–	4 417	3 590	1 389	1 380 [d]	.	47
Cambodia	Feb. 1955–	596	542	283	281	.	43
Ceylon [b, h]	May 1954–	1 860	1 559	780	760	.	29 [h]
China (Taiwan)	May 1951–	4 683	4 154	2 682	2 680 [d]	.	41
Hong Kong	April 1952–April 1955	379	326	86	99 [d]	24	77
India [b]	July 1951–	79 233	63 186	28 005	27 610 [d]	.	..
Indonesia [h]	Nov. 1952–	10 154	7 882	2 746	2 733	.	50 [h]
Iran	May 1952–	1 708	1 420	995	990	.	24
Iraq [h]	Aug. 1952–June 1955	657	545	238	234	21	48 [h]
Jordan [e]	Dec. 1953–	695	618	343	340	.	. [e]
Malaya, Federation of	Jan. 1951–Dec. 1953	659	617	328	359 [d]	22	43
West New Guinea	May 1956–	23	22	12	12	.	28
Pakistan [b, h]	July 1951–	18 872	14 508	6 488	6 387	.	43 [c, h]
Philippines [h]	Oct. 1951–	8 055	6 954	3 358	3 387 [d]	.	49 [h]
Sarawak	July 1952–Dec. 1953	155	129	57	59 [d]	28	45
Singapore	June 1951–Dec. 1953	95	90	36	37 [d]	18	61
Thailand [h]	Nov. 1951–	6 610	5 206	2 327	2 325	.	38 [h]
Turkey [e]	Jan. 1953–	11 159	10 220	4 528	4 495	.	. [e]
Viet Nam	April 1954–	740	648	245	242	.	57
Total		162 360	132 146	60 757	60 222	.	.

A common problem was that a more or less substantial proportion of the persons tested failed to return for the reading of the test (see Table I). Out of the 162 million persons given a tuberculin test about 19% were lost to the campaigns through failure to return. This percentage varied considerably among countries; in the American campaigns the loss ranged from 4% to 12% and in the African and Asian campaigns from 2% to 27%, although in Egypt it reached 35%; the vaccination, on the other hand, was almost complete: practically all persons found tuberculin negative were vaccinated, the percentage for the entire programme being 99.1.

An analysis of the age-distributions of the population tested in the 17 countries where the internationally-assisted campaigns have been completed shows that, on the average, 20% were under 7 years of age, 39% were 7-14 years old and 41% were 15 years or over; the distribution, however, varies considerably from country to country. In several countries and territories, both in America and in Asia, more than half those tested are aged 15 years and over (in Brunei, for example, the proportion is 56% and in Jamaica and British Honduras 53%). In other countries, chiefly in Asia, the age-group 7-14 years predominates (in Iraq, 56% were of this age-group and in Malaya 65%); in these countries the campaigns have apparently been largely conducted in the schools.

The distribution by age of the vaccinated population was, on the average, as follows: under 7 years of age, 32%; 7-14 years, 46%; 15 years and over, 22%. The vaccinated population is thus, on the whole, younger than the tested. The reason for this is that the proportion of persons eligible for vaccination among the tested population decreases with age; on the average, the proportion eligible for vaccination was 86%, 61% and 28%, respectively, in the three age-groups.

The purpose of the mass campaigns is to cover the populations in the areas where such projects are initiated by tuberculin-testing as many people as possible within specified age-groups and vaccinating with BCG the non-reactors to tuberculin. A measure of the success of the campaigns in this respect would be the proportion tested within the specified age-groups (the " coverage "). Table I shows the coverage of the child population (0-14 years) for the 17 countries where the campaigns have been completed. The figures have been computed by relating the number of children with test read to the total number of children aged 0-14 years. In 7 countries less than a third of the children under 15 years participated in the campaigns: in one country (the Federation of Ethiopia and Eritrea) the proportion was as low as 4%. A coverage of 75% or more was achieved in 4 countries, all in the Americas.

An attempt has been made to obtain some indication of the prevalence of tuberculous infection in individual countries by computing the proportion of tuberculin-positives among the school-age children (7-14 years) with test read (Table I). The age-group 7-14 years was chosen because it is the one best covered; furthermore, the age-composition of this group may be assumed to be rather uniform from country to country.

The frequency of positive reactors is seen to be comparatively low in the American countries, ranging from 13% in Costa Rica to 35% in British Guiana; a single exception is Barbados, where the positivity rate attained 47%. In the four countries on the African continent the percentages are also relatively moderate—namely, 29% to 43%. In Asia, on the other hand, the frequency of positive reactors is generally high, reaching 77% (Hong Kong) and exceeding 40% in all but three countries (Iran, Ceylon, and Thailand).

The " percentage positive " figures should be interpreted with caution, however. Results from tuberculin surveys conducted with uniform techniques in widely separated areas [5] indicate that in addition to the strong specific tuberculin sensitivity found everywhere there occurs in many parts of the world a low-grade, non-specific sensitivity to tuberculin. In areas where this non-specific sensitivity is widespread the efficiency of the

[5] *Bull. Wld Hlth Org.*, 1955, **12**, 63

TABLE II. NUMBER OF PERSONS TUBERCULIN-TESTED AND VACCINATED WITH BCG. COVERAGE OF AGE-GROUP 0-14 YEARS, AND PERCENTAGE POSITIVE IN AGE-GROUP 7-14 YEARS, BY CIVIL DIVISION, IN CAMPAIGNS COMPLETED DURING 1955-56

Country and division	Number of persons				Coverage [a] of age-group 0-14 years (%)	Percentage positive in age-group 7-14 years
	given test	with test read		vaccinated		
		total	negative			
British Guiana	207 733	191 731	111 400	111 325	65	35
Counties:						
Berbice	55 374	49 496	28 922	28 908	67	38
Demerara	126 777	118 919	69 006	68 972	67	33
Essequibo	25 582	23 316	13 472	13 445	53	40
Federation of Ethiopia and Eritrea	609 321	460 715	294 781	294 300	4	29
Ethiopia	385 730	286 757	176 297	176 030	..	33
Provinces:						
Addis Ababa	95 610	70 921	38 527	38 446	..	41
Arussi	16 823	11 987	8 737	8 734	..	23
Beghemeder	19 226	15 507	10 992	10 990	..	8
Godjam	10 022	8 498	6 795	6 793	..	8
Harar	75 213	53 522	26 984	26 939	..	5
Kaffa	23 742	15 810	8 834	8 739	..	34
Shoa	60 990	45 234	29 355	29 334	..	30
Sidamo	18 571	14 909	10 690	10 684	..	22
Tigre	36 321	27 520	18 632	18 630	..	24
Wollega	9 990	8 131	6 026	6 025	..	22
Wollo	19 222	14 718	10 725	10 716	..	22
Eritrea	223 591	173 958	118 484	118 270	..	23
Provinces:						
Akale-Guzai	32 322	28 565	22 096	22 096	..	20
Argodat	19 470	15 800	11 314	11 314	..	22
Cheren	22 620	18 779	12 944	12 942	..	28
Hamassien	23 499	19 707	16 008	16 008	..	20
Asmara town	70 465	48 394	25 613	25 402	..	28
Red Sea	21 207	15 094	7 407	7 407	..	39
Serae	34 008	27 619	23 102	23 101	..	15
Hong Kong	378 922	326 372	85 942	98 588 [b]	24	77
Districts:						
Victoria Island	230 914	189 958	46 471	57 786	..	77
Kow Loon	115 820	107 159	31 184	32 448	..	77
New Territories	32 188	29 255	8 287	8 354	..	73
Iraq [c]	657 331	545 420	238 086	234 153	21	48 [c]
Provinces (Liwas):						
Amarah	18 937	13 426	6 853	6 845	8	40
Arbil	11 443	9 840	5 077	5 000	8	41
Baghdad	305 865	258 184	102 948	100 346	60	53
Basrah [c]	95 978	73 862	32 369	32 048	39	40 [c]
Dialah	36 235	31 082	15 132	15 082	18	34
Diwaniyah	32 506	26 677	10 660	10 627	12	51
Dulaim	28 071	26 036	15 746	15 682	26	33
Hillah	18 412	17 430	8 142	8 117	13	41
Kerbalah	17 821	14 489	5 060	5 051	10	61
Kirkuk	28 062	24 211	11 022	10 980	14	43
Kut	24 007	17 139	8 268	8 238	13	45
Mosul	9 096	8 361	4 464	3 826	3	35
Montafig	17 956	14 143	6 983	6 964	8	46
Sulaimaniyah	12 942	10 540	5 362	5 347	9	41
Libya	318 071	236 284	133 334	132 812	34	37
Provinces:						
Cyrenaica	98 856	71 281	36 844	36 767	..	38
Fezzan	30 244	25 275	15 938	15 503	..	29
Tripolitania	188 971	139 728	80 552	80 542	..	37

.. = data not available

[a] See Table I, footnote (a)

[b] Including 12 988 newborn vaccinated without previous test

[c] The data include retesting and revaccination of some persons; the percentage of positives has been calculated on the basis of limited material excluding such data.

TABLE III. NUMBER OF PERSONS TUBERCULIN-TESTED AND VACCINATED WITH BCG, BY AGE, IN CAMPAIGNS COMPLETED DURING 1955-56

Country	Number of persons with test read				Number of persons vaccinated			
	Age-groups (years)			Total	Age-groups (years)			Total
	0-6	7-14	15 and over		0-6	7-14	15 and over	
British Guiana	45 452	71 445	74 834	191 731	41 187	46 127	24 011	111 325
Ethiopia & Eritrea, Federation of	111 188	164 974	184 553	460 715	98 601	116 738	78 961	294 300
Hong Kong	74 216	140 966	111 190	326 372	60 005	32 888	5 695	98 588
Iraq	57 420	306 698	181 302	545 420	44 914	155 761	33 478	234 153
Libya	56 839	93 529	85 916	236 284	45 096	59 051	28 665	132 812
Total, number	345 115	777 612	637 795	1 760 522	289 803	410 565	170 810	871 178
Total, %	19.6	44.2	36.2	100.0	33.3	47.1	19.6	100.0

tuberculin test is seriously reduced, as the largest non-specific reactions are indistinguishable from the smallest specific reactions. The percentages of positive reactors for such areas will therefore include a certain, often fairly high, proportion of persons with strong non-specific reactions and will thus produce a tendency to overestimate the frequency of tuberculous infection. Obviously, the occurrence of non-specific sensitivity also interferes with the selection for vaccination;[6] uninfected persons with strong non-specific reactions will be excluded from vaccination. The problem may be solved to some extent by raising the limit for what is to be considered a "positive" reaction. In BCG campaigns this would mean that fewer uninfected persons would be excluded from vaccination at the expense of some increase in the proportion of infected persons that would be vaccinated. This solution was adopted in some of the WHO/UNICEF-assisted campaigns. Thus late in 1955 and at the beginning of 1956 the criterion for a positive reaction was raised to 10 mm in Cambodia, Burma and China (Taiwan) and to 8 mm in India and Thailand.

More detailed statistics for the five BCG vaccination campaigns completed in 1955-56 are given in Table II (by administrative division) and Table III (by age); corresponding breakdowns for the campaigns completed during 1952-54 have been given in previous reports.[7-10]

It appears that the percentage of persons not completing the test, the age-distribution of tested and vaccinated, and the coverage of population all vary as much within the countries as between the countries. Similarly, the frequency of positive reactors shows considerable variation between localities. These within-country variations should be interpreted as cautiously as the inter-country variations; the prevalence of non-specific sensitivity may well be high in one part of the country and low in another, as has been found in India and Pakistan.

[6] So far, a high prevalence of non-specific tuberculin sensitivity has been demonstrated by WHO/UNICEF BCG assessment teams in a number of territories where BCG campaigns are in progress, viz. Burma, Cambodia, South India, Indonesia, East Pakistan, the Philippines, Sudan, Taiwan, Thailand and Viet Nam.

[7] *Mass BCG vaccination in Egypt 1949-52, with special reference to statistics on BCG vaccination and pre- and post-vaccination allergy*, Copenhagen, 1953

[8] *Bull. Wld Hlth Org.*, 1954, 10, 113

[9] *Bull. Wld Hlth Org.*, 1955, 12, 301

[10] *Chron. Wld Hlth Org.*, 1956, 10, 126

WORLD HEALTH DAY 1957

World Health Day was observed throughout the eighty-eight Member and Associated Member States of WHO, and in all the Member States of FAO, on 7 April. This year, for the first time since its inception, World Health Day was the concern of two organizations—WHO and FAO—as the theme " Food and Health " was of equal importance to both. The two specialized agencies work in close collaboration on a number of common projects and the World Health Day theme provided a good example of how the work of the two organizations is inter-linked.

As in previous years, National Health Administrations and local Health Authorities used the occasion of World Health Day to underline the importance of health needs and to stimulate the people's co-operation in health action. The double message in this year's theme, and the fact that it was sponsored by both FAO and WHO, resulted in an even wider observance than in the past.

To give an indication of how the theme was treated in the various special messages which were issued on the occasion of World Health Day the following passages have been extracted from them:

" It is, I think, clear that the relationship between food and health has become a very close and intricate one, and that we can no longer let ourselves be guided simply by the customs and beliefs of earlier generations. There is no area of the world, no country and no culture which today can afford to neglect the scientific teaching now available on nutrition, food values, and the techniques of producing and processing food. "

*** Dr M. G. CANDAU, Director-General, WHO

" *The phrase 'marry health and agriculture' was first used at the League of Nations Assembly in 1935, during a debate on nutrition. It is a key phrase and incidentally enshrines one of the basic principles which led to the establishment of FAO. Clearly the objective of 'food for health' cannot be attained unless the necessary foods are produced in sufficient amounts and people are able to obtain them. Health is therefore dependent to a considerable degree on the development of agriculture, and here I may also include fisheries since fish is a valuable food which effectively supplements the imbalanced diets characteristic of many countries.*"

*** B. R. SEN, *Director-General, FAO*

" There is no real or compelling reason why, for the majority of people throughout South East Asia, . . . important vitamins should not be available in adequate amounts. Take three examples . . . The amla, from a tree that flourishes in hot zones as well as in cooler hilly tracts, is already widely used as a condiment or in the form of preserves; it merely needs to be more suitably prepared or can even be eaten raw. Rice, so sadly mistreated by being polished, is the staple food of millions; it demands only to be enjoyed more nearly as nature provides it. The papaya, which thrives almost anywhere, could with ease be grown in every available plot of ground; it might then, becoming more plentiful than it is today, take its rightful place in the diet of every family at little cost. All these things are economically quite feasible and, once introduced, could be continued very cheaply.

" Thus it is clear that food for health is often as much a problem of education as of economics. To educate, however, means far more than merely to inform. Simply to tell people that they should, or should not, eat certain foods and that they should, or should not, feed them to their children is by no means enough. For it is a common human trait to cling to food habits learnt early in life, and most of us do not readily change such habits overnight.

" Health education for better nutrition, using methods which will teach people to enjoy the foods they need rather than merely telling them what they ought to eat, must therefore be recognized as a long-range task of the utmost importance. Indeed, there would seem to be every reason to give to this kind of nutrition education a much higher priority rating in schemes of national development than it holds today. For only then can we begin to make sure that in future our peoples shall have not only enough food

but also enough of the right kinds of food for health, strength and a more abundant life."

*** Dr C. MANI, WHO Regional Director for South-East Asia

" *Thanks to the discoveries of science, which has advanced more in the last 50 years than in the previous 2000 years, we now have the knowledge and the power to produce sufficient food, measured on a health standard, for more than twice the population of the world and also to eliminate or control most of the killing diseases.*

" *Where this new knowledge has been applied the expectation of life has been extended. By 1900 it had reached 50 years. For many children born today it is about 70 years.*

" *But this knowledge has not yet been applied to the whole human family. At birth, the expectation of life of two-thirds of the people in the world is only 30 to 40 years. Thus 1600 million people suffer premature death (often in infancy) from disease which can be prevented, and lack of food which can be provided.*

" *This is a challenge to our civilization.*"

*** Lord BOYD-ORR

"Recent work suggests that death from heart disease is closely linked to the over-eating of fats, particularly hard fats, which have tended to represent an ever-increasing proportion of the diet of prosperous Western nations.

" Thus it may appear that one part of the world is still suffering from hunger and malnutrition while another part literally ' eats itself to death '.

" Prevention of these two extremes entails greater understanding, on the part of both individuals and of governments, of sound nutrition, of nutrition education and of nutrition planning."

*** Dr JEAN MAYER, Associate Professor of Nutrition, Harvard School of Public Health, Boston, USA

" *A discussion of food superstitions and taboos—also cultural phenomena—would . . . require a volume to itself with illustrations drawn from all types of human society, civilized and primitive. Dr Cicely Williams, who introduced the word 'kwashiorkor' into medical literature, writes :* [1]

' *In East Africa, where kwashiorkor is alarmingly common, there are places where meat and milk are available but the women and children do not get them. The women are told that if they eat eggs they will become sterile, if they eat fowls they will crow, if they eat goat they will grow beards.*'

" *These are extreme examples, but there would be no difficulty in finding less picturesque ones nearer home.*

" *Food production, processing and transport, wage levels, food prices—all these are only one side of the picture ; on the other are human beings and their incalculable behaviour.*"

*** Dr W. R. AYKROYD, *Director, Nutrition Division, FAO*

" There is no easy road to better health for the children through better nutrition. Parents throughout the world need help to break the vicious circle of malnutrition—disease—poverty and still more severe malnutrition.

" Research workers can pursue the scientific facts on which sound action can be based. Government authorities can do their part to facilitate the development and better use of local resources.

" But unless each individual in the community is prepared to accept the adventure of new ideas and new ways little can be accomplished. All over the world, however, people are setting out on that adventure, and progress is being made more rapidly than ever before in man's history."

*** Dr R. BURGESS, Chief, Nutrition Section, WHO

Dr J. BIERMAN, Chief, Maternal and Child Health Section, WHO

" *It is evident that the need to bridge the gap between the developed and less developed regions by raising the levels in the latter will be the main feature of the world food problem for some time to come.*

" *Since movement of foods from surplus to deficit areas is hampered by serious economic and other obstacles, the objective can best be achieved by increasing local food production in the under-fed areas. The required increases in those areas will, however, call for much greater efforts than those envisaged at present in most of them.*

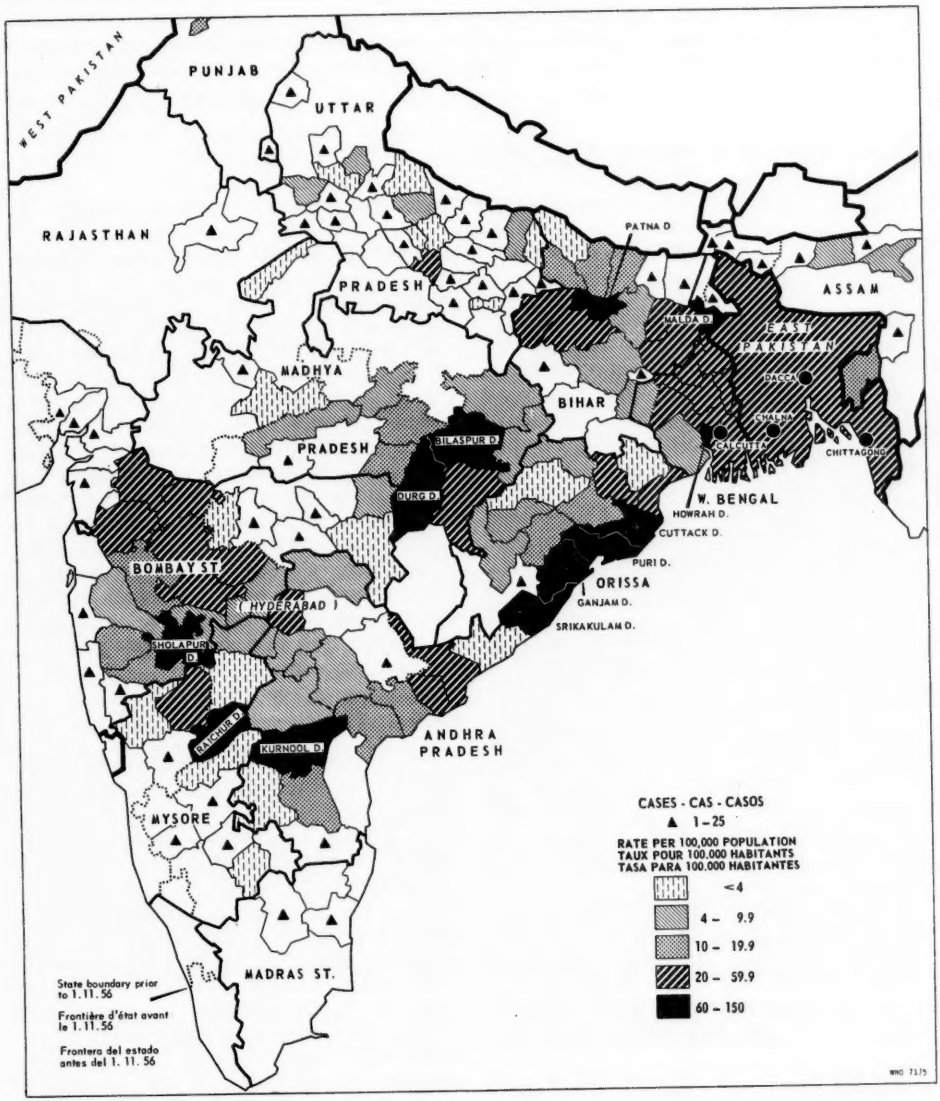
" *It is probably justified to say that in the foreseeable future the world can feed its increasing population even at modestly higher levels of nutrition provided that the problem is faced now and that the necessary efforts are made by everybody concerned.*"

*** Dr K. K. P. N. RAO, *Chief, Food Consumption and Planning Section, Nutrition Division, FAO*

[1] *Lancet*, 1954, **1**, 323

CHOLERA IN 1956

Nearly 66 000 cases of cholera were notified in India and East Pakistan in 1956. This total, which accounted for just under 100% of all officially notified cholera cases in the year, is higher than that recorded for the same areas during the two preceding years



(32 000 in 1955 and 36 000 in 1954) but well below the annual average of 160 000 cases recorded officially over the period 1949-53. This information is contained in a brief note on the world cholera situation which appears in a recent issue of WHO's *Weekly Epidemiological Record* (No. 16, 1957).

The accompanying map shows the cholera incidence in 1956 by districts of India, based on provisional notifications. As can be seen, the highest rates—apart from the endemic areas of East Pakistan and West Bengal—were recorded in the districts of Patna in Bihar, the coastal areas of Orissa, in the Bilaspur and Drug districts of Madhya Pradesh and the districts of Sholapur, Raichur, and Kurnool in the southern Deccan area.

Reports of Expert Groups

PREVENTION OF RHEUMATIC FEVER

The second report of the Expert Committee on Rheumatic Diseases, which has just been published,[1] reviews the problem of the prevention of rheumatic fever and makes practical recommendations which may serve as a guide to the future development of national and local rheumatic fever prevention programmes.

At the outset, definitions of rheumatic fever and of chronic rheumatic heart disease are given, in order to clarify the terms used in the report. The importance of rheumatic fever is held to be its liability to give rise to permanent heart disease.

Exact statistics on the prevalence of rheumatic fever and rheumatic heart disease are not obtainable at the present time. The existing sources of information are mortality statistics, statutory reporting or notification, surveys of healthy persons, and statistics on hospital admissions. The element of personal judgement on the part of the individual medical practitioner introduces an uncertainty into most of the figures thus obtained.

Mortality statistics cited in the report show that in persons under the age of 35 cardiovascular diseases, excluding congenital defects, account for 3-5% of all deaths. In this age-group, rheumatic heart disease is believed to be the only significant cardiovascular cause of death, apart from congenital defects. Surveys of schoolchildren in the USA and Italy have shown that a proportion of 1-2% have heart lesions indicative of a previous rheumatic attack. Similar rates were found among men drafted into the US armed forces. Hospital admission statistics from widely dispersed parts of the world also show a proportion of 1-2% of acute rheumatism and chronic rheumatic heart disease.

The best method of obtaining further information is deemed to be by means of properly designed pilot population surveys but, in view of the expenditure that would be entailed, this is recommended only as a research procedure.

Studies on streptococcal infections

Infection with group A haemolytic streptococci is now recognized as the only established causative factor in acute rheumatic fever. Clinical observations, epidemiological studies, and laboratory evidence are available in support of this belief. The demonstration that the use of antibacterial drugs prevents recurrences of rheumatic fever and that antibiotic treatment of streptococcal sore throat can prevent first attacks of the disease constitute further evidence.

Extensive studies in a large military population have indicated that 3% of acute streptococcal infections of the respiratory tract are followed by rheumatic fever. Other

[1] *Wld Hlth Org. techn. Rep. Ser.*, 1957, **126**. 27 pages. Price: 1/9, $0.30, or Sw. fr. 1.—. Published in English, French, and Spanish.

more limited studies, however, have produced figures which suggest that the civilian population rate may be substantially less.

Other factors in the pathogenesis of rheumatic fever may be environmental conditions, heredity and nutrition; much further work is necessary before the true significance of all these factors can be established.

Advantages of penicillin therapy

While the use of sulfonamides, administered orally, for the prevention of rheumatic recurrences in known rheumatic patients has repeatedly proved its effectiveness—and has the additional advantage of low cost—penicillin, administered by mouth or by injection, has proved more effective and, moreover, less toxic. It is stressed in the report that sulfonamide treatment of streptococcal infections has been quite ineffective in the prevention of first attacks of rheumatic fever, presumably because it is unable to eradicate streptococci from the upper respiratory tract. Penicillin, on the contrary, has been proved effective for this purpose, as, for example, in young adults in military populations, where early treatment of the streptococcal pharyngitis or tonsillitis with therapeutic dosage of penicillin for at least 7-10 days was successful.

There is no method for preventing streptococcal infections in the population at large. In small closed or semi-closed communities, such as schools, children's homes, institutions, and camps, however, epidemic control has been possible, through chemoprophylaxis and carrier isolation. Again, in the case of excessive exposure, such as occurs in the wards of hospitals, epidemic control is simple. Here, the aim of penicillin prophylaxis should be to maintain high and constant blood levels throughout the period of exposure. A possible schedule might be double the dosage recommended in the report for continuous prophylaxis in a rheumatic fever patient.

The report advocates that nurses, social workers and other personnel in hospitals and institutions should be instructed in the danger to the rheumatic patient of streptococcal infection and in the early protective measures that need to be taken. Also, the hospital administrator should be made aware of the benefits of a preventive programme, from the standpoint both of the patient and of economy in hospital services through the prevention of recurrences. Measures should be taken to ensure that adequate supplies of penicillin are available for all rheumatic patients, regardless of economic status.

Prevention of rheumatic fever relapses

The prevention of recurrences in known rheumatic fever patients likely to result from casual exposure to streptococcal infection under ordinary conditions of life is much more difficult. Continued prophylaxis is deemed necessary for long periods of time in individuals who usually feel perfectly well, and its success depends on, *inter alia*, clearly established diagnosis of rheumatic fever according to generally acceptable criteria; assistance of the public health services to ensure continuous medical surveillance; and continuance of prophylaxis throughout the year despite the seasonal occurrence of streptococcal infection.

The choice of the prophylactic agent for the individual patient and the method of its administration is left for the physician to decide. The report gives suggested drug dosage schedules for continuous prophylaxis and for treatment of streptococcal infections.

In the case of a known rheumatic patient developing a superimposed streptococcal infection, early intensive treatment with large doses of penicillin over a ten-day period is recommended.

In isolated cases of streptococcal infection in the community, the physician should be able to institute effective treatment by penicillin and thus prevent first attacks of rheumatic fever. Attention is drawn specially to the importance of prolonging treatment for 10 days, to ensure eradication of the streptococcus.

The report concludes that, if known rheumatic subjects are not allowed to develop infection with the haemolytic streptococcus, they will not develop rheumatic fever relapses.

Moreover, attacks of rheumatic fever may be prevented if all infections with the haemolytic streptococcus are recognized and treated promptly and efficiently so as to eradicate the micro-organism with as little delay as possible.

Much well-controlled research is needed to find effective methods of early streptococcus case-finding on a community-wide basis, and the school health service may serve as a useful screening device for this purpose.

Although the form of a rheumatic fever prevention programme in any individual country must depend on the relative importance of the disease, it is felt desirable that everything possible should be done to protect individual cases. Hence, it is advocated that some form of efficient prophylaxis should be instituted for persons known to have rheumatic fever or chronic rheumatic heart disease and that all recognized cases of acute haemolytic streptococcal infection should be given adequate treatment with penicillin. Nevertheless, before submitting a patient to a prolonged period of prophylactic treatment, the diagnosis of rheumatic fever should be made as precisely as possible, and the Jones criteria (modified) are advocated for this purpose.

These criteria are reproduced in an annex to the report.

ATHEROSCLEROSIS AND ISCHAEMIC HEART DISEASE

The rising mortality from ischaemic heart disease is one aspect of the general problem of atherosclerosis which is of growing concern to public health authorities. Accordingly the WHO Study Group on Atherosclerosis and Ischaemic Heart Disease, which met in Geneva from 7 to 11 November 1955, decided to focus its discussions on this question. The report of this group, which has recently been published,[1] discusses the present status of knowledge of the etiology and pathogenesis of atherosclerosis and ischaemic heart disease and advises on means of broadening this knowledge so as to provide a basis for effective prevention work.

Ischaemic heart disease is defined as the cardiac disability, acute and chronic, which arises from reduction or arrest of blood supply to the myocardium, in association with disease processes in the coronary arterial system. The two main pathological processes involved are atherosclerosis of, and thrombosis in, the coronary vessels. Atherosclerosis includes several quite distinct intimal processes, such as fatty changes, fibrous thickening, fibrin incorporation, and calcification. In ischaemic heart disease—the end product of atherosclerosis—multiple causative factors must therefore be considered. These multiple factors may operate differently, and thereby produce different pictures, in individual cases and in the disease as it occurs among various ethnic and social groups.

Role of constitutional factors

The factors involved in the origin of atherosclerosis and ischaemic heart disease are of two kinds—namely, those arising from heredity and those occurring in the environment. They are not always easily dissociated and comparisons of morbidity and mortality in different races and social groups often embrace both kinds of factor. The problem is to ascertain how far heredity is a determining factor or whether it is overborne by environmental factors.

A striking characteristic of ischaemic heart disease is the great variation in its incidence and mortality in different populations, even when allowance is made for age distribution. It has been reported, for example, that middle-aged men in the United States of

[1] *Wld Hlth Org. techn. Rep. Ser.*, 1957, 117. 40 pages. Price: 1/9, $0.30, or Sw. fr. 1.—. Published in English, French, and Spanish.

America, Great Britain and Finland are more prone to die of ischaemic heart disease than are men of the same age in Norway or Denmark, and that they are also several times more prone than are men in Italy or Portugal. Other comparisons reveal even greater disparities. The report states that such differences could possibly be genetic in origin, but if, on the other hand, it should be that they were mainly due to differences in ways of life, this would open up new lines of investigation which might disclose major causative factors of atherosclerosis and ischaemic heart disease.

Another point referred to in the report is the relationship of the incidence of ischaemic heart disease to sex differences. Investigations which have taken place in the USA, Great Britain, and Sweden have shown a pronounced difference in mortality from myocardial ischaemia between the two sexes in the age group 40-59 years—males showing a considerably higher mortality than females. In the USA, where ischaemic heart disease is frequent, the ratio of male to female deaths is very high in young persons and diminishes after the menopause. However, in Italy and Portugal, where the disease is not so frequent, the disparity in frequency between the sexes is smaller.

Apart from differences in mortality the course of the disease may itself differ between the sexes, and males will suffer a more dramatic and rapidly fatal development. These facts emphasize the importance of giving due consideration to the sex ratio in epidemiological investigations. Although sex differences are striking, interpretation of the variations is difficult, as men and women live differently in many ways. Consideration must therefore be given not only to sex-linked inheritance and to differences in endocrine factors such as androgen and oestrogen levels, but also to the possible effects of differences in environmental factors such as physical and mental activity, emotional strain, diet, and the use of stimulants and intoxicants.

The association between metabolic influence and the prevalence of atherosclerosis and ischaemic heart disease has already been established. Clinical observations have shown that a number of endogenous metabolic disorders can predispose to atherosclerosis. For example, it is well established that atherosclerotic disease is now the chief cause of death in diabetes. Significantly the incidence of and mortality from diabetes tended to fall in parallel to the sharp drop in the death rate from ischaemic heart disease observed in certain countries during the Second World War.

Role of environmental factors

It is clear that a relationship exists between certain aspects of day-to-day living and the incidence of ischaemic heart disease. Considerable evidence has accumulated to suggest that diet is a factor which is directly or indirectly influential. Research carried out with animals has shown that dietary manipulation can produce atherosclerosis in various species, although it has not yet been possible to produce the equivalent of human ischaemic heart disease. However, the results of some experiments, in which aspects of ischaemic heart disease were simulated, have shown that dietary factors play a most prominent role.

The report mentions various items of information which point to the significance of diet as an initial factor. They are: the war-time changes in mortality rates of ischaemic heart disease in countries where people were forced to change their diets; the difference in frequency of atherosclerosis and myocardial infarction among peoples subsisting habitually on different diets; life insurance data relating to persons of different relative body-weights who are presumed to have different dietary habits; and, perhaps, indications of a progressive rise in ischaemic heart disease in younger men in countries where there have been progressive changes in the character of the diet. Although it could not be said that the diet is isolated as the only independent variable in the examples given, nevertheless the appearance of a consistent dietary pattern does suggest that it is of particular significance.

However, several different aspects of the diet have to be taken into consideration. For example, the first item to be considered was dietary cholesterol; almost 50 years ago this was shown to be capable of producing atherosclerosis in the rabbit. It is now known that various animal species differ markedly in their response to cholesterol contained in natural foods or added in pure form to the diet. Man differs greatly in this respect from the animals used for experimental purposes and it now seems that, provided conditions are constant, the blood cholesterol level in man usually responds little, or not at all, to variations in cholesterol intake corresponding to the range represented by the great majority of human diets.

With regard to the question of dietary fat, the Study Group considered it possible that the statistical excess in mortality from heart diseases in overweight people was not related solely to excessive calorie intake, but to an unduly high intake of certain fat ingredients, particularly certain types of fats which in the more technically developed countries are present in considerable quantities in rich diets. It is of considerable interest that, among the various populations which have been studied, the incidence of atherosclerosis and ischaemic heart disease is relatively low in those groups which subsist on a low fat diet. Examples of such groups given in the report are the male populations of Japan, Korea, and Okinawa; the Bantu in Uganda and South Africa; the Mayan Indians of Guatemala; the Yemenite Jews; the Indonesians; the tribes in Nigeria; the Bolivians and Peruvians, and the inhabitants of southern Italy and Sardinia.

Evidence of the same trend was to be found in the war-time changes in mortality ascribed to aschaemic heart disease in some countries. Generally speaking these changes followed a reduction in the amount of fat in the diet and were observed to be greatest where the reduction was at its maximum. Not only did mortality from ischaemic heart disease fall a year or so after subsistence on a low fat diet began but the converse was true following the restoration of fat in the diet. As the fat content of the diet is today increasing in many parts of the world the importance of discovering the effects of fat consumption is obvious.[2]

Data on actual food consumption, including fat intake, in different countries are far from adequate and do not serve to show what may be the dietary customs of different groups within a nation. In this connexion the co-operation of FAO in obtaining data on food consumption will contribute to further progress.

Calories, obesity, and overweight

One of the dietary factors which may bear on the incidence of ischaemic heart disease, and which has attracted the greatest general interest, is that of the imbalance reflected in relative obesity or overweight. The report of the Study Group draws attention to the fact that the terms "obesity" and "overweight" are not synonymous. Relative obesity refers to the proportion of the body mass composed of fat, and obesity means that the proportion of fat in the body is unduly large. Overweight refers simply to the state of being above the average or standard for one's height, age, and sex. The truly obese person is likely to be one who shuns physical activity in addition to overeating, so that his body-weight is no accurate measure of his fatness.

Evidence indicating the importance of obesity in regard to heart diseases is very largely derived from statistics in which the variable is actually overweight. There is no convincing evidence that relative obesity, by itself, is a major factor in atherogenesis or in the production of ischaemic heart disease in man. Other evidence which suggests that obesity in itself is not a primary factor in producing ischaemic heart disease has come from population studies. Obesity is not uncommon in many countries where there is

[2] Since the meeting of the Study Group was held, there has been an increased interest in the effects that certain vegetable and marine oils appear to have on the blood cholesterol level. Certain members of the Group expressed a wish that the published report should contain a strong recommendation for research in this field. Advances in knowledge resulting from recent work may be of considerable potential public health importance. Further research may even permit of the development of easily applicable preventive measures.

far less ischaemic heart disease than, for example, in the USA and Great Britain. Calculations which have been based on life insurance data show that if all markedly overweight persons were removed from the USA the mortality rate from ischaemic heart disease in the remainder would still be very much higher than in some other countries —for instance, Norway, Italy and Japan— despite the fact that obesity in these latter countries is by no means a rarity.

Linked with the question of obesity is the theory that physical activity is an important determinant in the etiology of ischaemic heart disease. This, as the Study Group points out, has by no means been proved. Some evidence does suggest that men whose occupations do not demand a high degree of physical activity tend to suffer from ischaemic heart disease more frequently and more severely than their counterparts in more active jobs. However, other evidence is contradictory and it should be borne in mind that variations in the level of physical activity are generally associated with variations in other aspects of day-to-day living, notably in dietary habits.

It is a popular belief that psychological factors such as stress, strain and mental tension play some part in the genesis of ischaemic heart disease. As the Study Group takes pains to point out, this belief appears as yet to have no scientific basis. However, the greater incidence of the disease in highly organized communities than in those of a more simple character has been attributed to differences in the tempo of life, relation between the sexes, social insecurity, and striving for dominance—all of which have their repercussions on the emotional life of individuals. In this connexion it was felt that more systematic research into cultural and psychosomatic relationships in both atherosclerosis and coronary thrombosis was urgently required.

Suggested lines of research

The main conclusion of the report is that the control and prevention of ischaemic heart disease can be brought about only as a result of improved knowledge of the relation of environmental factors and ways of life to the pathogenesis of the disease and to the consequent morbidity and mortality. The investigation of the relation to coagulation and thrombosis of such suspected factors as genetic and environmental influences, sex, specific inborn metabolic disorders, arterial hypertension, diet (with particular reference to dietary fats), level of physical activity, stress, strain and mental tension, deserves special emphasis in research work.

Lines of research are suggested, including, in an annex, a detailed description of the type of epidemiological study most likely to provide useful results. A second annex, on the public health aspects of the disease, deals with such matters as case-finding; screening; diagnostic, social, laboratory and nutrition services; and rehabilitation.

The need to standardize both clinical and pathological criteria and terminology in respect of ischaemic heart disease, atherosclerosis and related conditions is regarded as sufficiently urgent to warrant the recommendation that WHO should organize a study group to undertake this task. It is also recommended that WHO should continue to expand the collection and regular publication of mortality statistics on cardiovascular and related diseases, and should consider giving assistance to national statistical services in developing the analysis of mortality by occupation and social class. Attention is also drawn to the need for improvement in the collection and recording of mortality data and for greater standardization of terms and procedures. Simple field studies on the basis of death certification in different countries might, it is thought, quite quickly reveal the possibilities and limitations of the international comparisons now so commonly made. Greater use of insurance company data on heart disease is advocated as an additional means of assessing the importance of the problem.

ACCIDENTS IN CHILDHOOD

The proverbial phrase " accidents will happen " only too often reveals a widespread and fatalistic belief that little can be done to prevent them. However, with a better knowledge of why and how accidents occur, more effective preventive measures could certainly be taken. One particular problem—accidents in childhood—is giving increasing cause for concern among public health workers. The situation is particularly serious in Europe, where accidents to children over the age of one year outrank any other cause of mortality. This was one of the reasons which led the WHO Regional Office for Europe to convene a meeting of an Advisory Group on the Prevention of Accidents in Childhood. The members came from eight European countries and the bulk of the material discussed concerned countries in the Region.

The gravity of the present situation is well illustrated by the following remarks taken from the introduction to the Group's report,[1] which has recently been published: " In some countries [accidents] have become the chief cause of death in childhood and adolescence. Among certain groups of children, greater numbers are killed by accidents than by all other causes combined. This unenviable prominence of accidents in child mortality throughout Europe is due, too, to the new and dangerous hazards introduced into many homes and countries by modern technological progress. The spread of electrification, especially in rural areas, the introduction of highly potent insecticides, the increasing numbers of motor cars and bicycles on roads designed for thirteenth to fifteenth century traffic, may be cited as examples.

" It is not only as a cause of death that accidents in childhood are important. The number of non-fatal accidents is very much larger—between 100 and 200 times greater and by some estimates even more. This gives some indication of the suffering and loss, and sometimes permanent disablement or disfigurement, that is involved."

The large majority of accidents in childhood are without the slightest doubt preventable, and it was with the object of exploring the possibilities for development of preventive measures that the Advisory Group pursued its discussions.

Epidemiology of accidents

As the first part of its work the Advisory Group devoted its attention to the epidemiology of accidents. Under this general heading, discussion first centred on the international grouping of accidents. The mortality and morbidity statistics established in accordance with the *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death* gave, it was felt, a general idea of the frequency and importance of various causes of accidents, and the 781 headings in the Classification made it possible to collect an appreciable amount of information on type and mode of accidents.

In discussing the value of the epidemiological approach, the report makes the point that such a method offers a scientific basis for the study of accidents and accident prevention. In each case an explanation of causes can be sought through the interactions of the host—the child at risk; the agent—the effective cause of the event; and the environment—the chain of external circumstances culminating in the event.

The use of the epidemiological method in the study and control of accidents is well illustrated by an example from Norway. In this country, for some years past, drowning accidents, particularly those of children drowned in wells, attracted much public interest. As these deaths were thought to be largely preventable, a special study was initiated. An examination of wells throughout the country showed that they were often

[1] *Wld Hlth Org. techn. Rep. Ser.*, 1957, **118**, 40 pages. Price: 1/9, $0.30, or Sw. fr. 1.—. Published in English, French, and Spanish.

insufficiently covered or fenced. Disused wells were a particular hazard. A country-wide educational programme was started; state and voluntary health agencies and other bodies were mobilized, and the support of the press and radio enlisted. Although the original mortality figures were not large, there was a marked reduction in the number of children drowned in wells in Norway in 1955 compared with preceding years. Legislation for compulsory protection of wells was proposed and is at present under consideration.

Accident mortality and morbidity

The information contained in the report on the magnitude of the childhood accident problem as a whole gives much food for thought. Data which were presented to the Advisory Group showed that in several European countries, although the actual death rates from accidental injury in childhood decreased with age, the relative importance of accidents in the total mortality picture increased. Accidents were the leading cause of death in the age-group of 1-19 years, where they were responsible for 30%-40% of all deaths. These data demonstrated quite clearly that, for the European region, accident prevention should have a high priority among public health efforts.

In a working paper on children's deaths from accidents throughout the world it was indicated that accidents constitute an important problem also for countries outside Europe. In the United States of America and Canada about one-quarter of all the deaths that occur annually among pre-school children and one-third of the deaths among children going to elementary school result from mishaps of one kind or another. Accidents killed more than twice as many pre-school children as measles, scarlet fever, whooping cough, diphtheria, dysentery, tuberculosis, and poliomyelitis combined. Nevertheless death-rates reveal only a small fraction of the child accident problem. As the report stresses, before one can even comprehend the immense task of accident prevention in childhood, account must be taken of all the relatively trivial injuries such as bruises, cuts, minor burns, and non-fatal poisonings, adding to this the countless times when children narrowly escape disaster. A measure of the frequency of accidents to children was obtained from a British survey of 1000 children born in the Newcastle area in 1947. According to the records, 61 children in this group suffered a total of 66 accidents in their first year of life.[2]

In the USA a survey of morbidity conducted in California revealed that the accident rate for children from birth to four years of age was 1199 per 1000 per annum and for children between 5 and 14 years, 954 per 1000 per annum, as compared with a rate for all ages of 772.[3]

Need for detailed information

If childhood accident mortality is to be lessened it is of the utmost importance that more information with regard to the type of accidents should become available. Work is now being carried out in some countries to improve the reporting of fatalities due to traffic and other accidents, and the report gives illustrations from France, Belgium and England. In France, for example, it has been possible, with police co-operation, to obtain more rapid and complete reporting of road accident deaths. Prior to the present arrangement, statistics on road fatalities based on physicians' death certificates indicated about 4000 deaths annually. However, when based on police reports the figure proved to be approximately 8000 deaths annually, and this is clearly more representative of the actual situation.

In assessing information on mortality the report underlines the importance of grouping factual information on accidents by age, sex and cause. An indication of the value of such grouping is revealed in an analysis by sex which shows that aggregate accident mortality rates in the European region for boys are double or triple those for

[2] Spence, J. et al. (1954) *A thousand families in Newcastle-upon-Tyne*, London (Nuffield Foundation)

[3] California State Department of Public Health (1955) *Home Safety Project : annual report*, Berkeley, Calif.

girls at most ages. The least difference is observed in the younger age-groups.

After consideration of the availability and scope of data on accident mortality, the Advisory Group thought it of importance to emphasize the following points:

" 1. Deaths resulting from accidents are gaining in importance among children today because deaths from other causes have been reduced.

2. Accident mortality depends on the peculiarities of the situation in which the population is living. It is noted that, in some countries, although the number of motor vehicles in use is rising, the accident rate is not increasing in like proportion.

3. The main groups of fatal accidents in children are those caused by: (*a*) motor vehicles; (*b*) drowning; and (*c*) fire and burns. The proportion varies from one country to another.

4. There is a limit to the uses to which mortality figures can be put at the international level. Much more can be obtained from such data at the local level, through studies involving more efficient classification and intensive study of limited material."

With regard to the supply of information on morbidity, the report states that statistics are not generally available, with the exception of road accident statistics in some countries. If, therefore, good mortality figures are available, the question remains whether there is a need for morbidity studies. The Advisory Group thought that such studies were justified for the following reasons: (1) they could be designed to give more detailed circumstantial information of value for programme development on such matters as the place and circumstances pertaining to accidents; (2) they might expose an accident problem of unexpected proportions; and (3) morbidity statistics were particularly helpful in respect of the school-age groups where mortality rates were low.

Statistical studies

Consideration of statistical studies designed to serve as a basis for preventive work and its later evaluation, and the need for greater uniformity and thoroughness in recording information, led the Advisory Group to suggest, for those countries who might wish to use it, a simple accident-reporting schedule. The report also draws attention to a number of sources of statistical data such as: mortality records; records of accidents treated in hospitals and dispensaries; general practitioners' records; school health statistics; social or private insurance records; preventive child health service records; special morbidity studies including longitudinal surveys; records of police and other services concerned with particular types of accident; and records of special organizations concerned with accident problems. It was felt by the Group that these sources might be drawn upon for accident reporting in the future.

Causes, consequences and prevention

The last part of the report is devoted to the circumstances, causes and consequences of accidents and to a short review of the general principles of accident prevention. Attention is given to some of the social, physical, environmental and psychological reasons for accidents among children. Particularly stressed are such factors as the increasing use of electricity in the home, with the consequent multiplication of electric points and fixtures; the risks of poisoning, by reason of the large amounts of medicaments in the home and the practice of self-medication; and the increasing use of petrol for heating and cooking. It is pointed out that it would be impossible to determine the whole range of social consequences of an accident to a child, or even its ultimate cost to the community. As an illustration of this point, mention is made of a survey carried out in an orthopaedic hospital and covering 457 cases of burning accidents among children. The total hospital stay for the whole group exceeded 90 000 days and the entire cost came to over half-a-million dollars.

As to the various possible methods of preventing childhood accidents, the Advisory Group felt that a detailed examination of this

question was not called for at the present stage. However, in a brief review of the general principles, the Group stresses the three cardinal points in accident prevention—namely, education, engineering, regulation and law enforcement. It was generally agreed that the keynote of prevention was education in the widest sense of the word. It was an essential part of this education, both at home and in school, that the child should be made aware of the accident hazards of everyday life and of the means to avoid them.

PAEDIATRIC EDUCATION

In view of the major role of child care in general medical practice—and this amounts to one-third or more of total medical practice in certain countries—the special characteristics of childhood, and the content of a minimum paediatric educational programme, a WHO Study Group on Paediatric Education deemed it essential that paediatrics should take its place as one of the major subjects of the medical curriculum.

The report of the Study Group, which has just been published,[1] stresses that childhood is a time of life when the promotion of health can be carried out effectively by the physician as he supervises the child's progress. So that this duty can be accomplished with the greatest benefit a physician requires to have a specific knowledge of the subject as well as special skills.

The Study Group advanced several reasons for assigning a special status to paediatrics in medical education. They included:

(*a*) high morbidity and mortality during early infancy. In large areas of the world sickness and death among infants and children constitute a major public health problem;

(*b*) paediatrics is not a speciality limited to a technique, or to a disease or group of diseases. It is generally applied to a specific period of life;

(*c*) a child, nevertheless, is not a miniature adult. . . problems and diseases occur in this age-group which do not exist in adult life;

(*d*) the seeds of many diseases seen in adults, such as rheumatic fever, tuberculosis, and neurosis are sown in childhood.

The importance of extra-mural training was also emphasized in the report. Home visits and collaboration with public health nurses and social workers amplified the student's knowledge of disease and its concurrent problems outside the hospital.

The Group expressed the opinion that all paediatricians should take an active part in communal health work, fostering research and assessing and improving conditions in the community. For this reason it was considered essential for qualified paediatricians to devote at least three months to working in a health department or other social agency providing services for children.

Finally the Group made certain suggestions concerning the role of international agencies in the advancement of paediatric education.

[1] *Wld Hlth Org. techn. Rep. Ser.*, 1957, **119**, 20 pages. Price: 1/9, $0.30, or Sw. fr. 1.—. Published in English, French, and Spanish.

CONTROL OF BILHARZIASIS

The operation of an ever-increasing number of irrigation schemes in various parts of the world and the use of inexpensive and effective molluscicides have increased the need to find practical measures to control bilharziasis. Destruction of the intermediate host would appear to be a logical line of approach, but it has become apparent, in part indeed from the limited success of snail control, that comparatively little is known about the relationship between the ecology of the snails and the mechanism of infection.

The WHO Study Group on the Ecology of Intermediate Snail Hosts of Bilharziasis met in order to consider available data which could lead to practical suggestions on control measures and to make scientists and public health workers aware of the problems involved. The report of the Group has just been published.[1]

Physical factors

All snails which transmit bilharziasis show a high degree of tolerance to variation in the temperature of their habitat. They are able to withstand for a considerable time temperatures ranging from a little above freezing point to well above 37°C.

The effect of annual range of temperature on the length of the breeding season is of importance. In certain areas, the period of time during which the water is warm enough to permit oviposition, development and growth is only sufficient for the production of one generation. In latitudes where the warm season is longer, several generations may be produced, or breeding may even continue all the year round. Thus *Bulinus truncatus* in northern Iraq produces only a single generation annually, while in central and southern Iraq and in Egypt it produces two or more generations each year. *Australorbis glabratus* in north-east Brazil continues to breed all the year round. A similar situation exists with regard to those species of *Oncomelania* which produce only one generation annually in the northern part of their range, but breed all the year round in the warm southern areas.

In the past, it was thought that snail hosts of bilharziasis were unable to live in complete darkness. However, recently, *Bulinus truncatus* and *Australorbis glabratus* were bred and maintained in the laboratory in complete darkness over a period of at least five months. Also, field observations in Egypt, Rhodesia and South Africa have revealed breeding colonies in covered aqueducts or reservoirs in almost total darkness.

Light may have an indispensable stimulating action on the sex glands of the snails. If this theory were proved to be true, covering the irrigation channels, or piping the irrigation water could be considered as a practical measure of control.

Water movement in a habitat is beneficial to the snails because it promotes oxygenation of the medium. However, violent waves are generally deleterious to intermediate hosts of bilharziasis, as is fast-running water, which appears to prevent the establishment of breeding colonies, especially if the water is heavily laden with silt or other suspended particles.

The life cycle of the intermediate snail hosts is greatly affected by seasonal and climatic conditions. Floods appear to be uniformly harmful to snail populations, because they have all the deleterious effects of rapid current velocity with the addition, in some cases, of a marked drop in temperature which is sufficient to interrupt breeding. On the other hand, flooding due to rainfall may disperse the snails and lead to their establishment in habitats where they did not previously occur.

It has been shown by experiments carried out both in nature and in the laboratory that certain strains of snails resist desiccation for long periods. Survival out of water for periods ranging from three to eleven months has frequently been observed. It is for this reason that desiccation as a method of control can only be effective under certain conditions.

Chemical factors

Chemical factors also greatly influence snail populations. The mineral content of the water, for example, has a profound effect on the snails. The total amount of dissolved solids in the water is of less importance than the proportion of constituent salts. Considerable differences in tolerance exist between the different species. Thus, *Australorbis glabratus* is not inhibited by the sodium chloride content of the water until the concentration reaches 6000 parts per million,

[1] *Wld Hlth Org. techn. Rep. Ser.*, 1957, **120**, 38 pages. Price: 1/9, $0.30, or Sw. fr. 1.—. Published in English, French, and Spanish.

whereas *Bulinus truncatus* is seriously incommoded before the value of 4000 parts per million is reached. In addition to salts used as molluscicides, certain mineral salts, such as barium, nickel and zinc are toxic to the snails.

Biological factors

Although it seems doubtful that natural events and predators could ever be used as effective means of control, they may be of help in reducing snail populations. Among the animals which have been recognized as possibly being of value in the control of snails which transmit bilharziasis may be mentioned: water rats; certain species of ducks; turtles (some species feed almost exclusively on snails in nature); salamanders; clawed toads; certain species of fish (e.g., *Gambusia* spp.); many species of aquatic insects; crustaceans (e.g., fresh-water crabs of the Potamidae family); carnivorous leeches of various species; and certain ciliates and other snails.

Although there is no doubt that snails are affected by epidemic diseases of viral and bacterial origin, remarkably little information on the parasites and diseases of snails is available, and further research should be undertaken.

The feeding habits of various species of intermediate hosts may be important in determining the form in which stomach poisons can be applied. It has been observed, for instance, that *Tropicorbis centrimetralis* tends to feed on the river bed, while *Oncomelania* spp. feed on moist soil above the water-level and on micro-organisms found on living and dead vegetation.

Control measures

Although much remains to be learnt about the complex relationships existing between molluscicides, the snails, and the environment, the following details were considered by the Group to be useful in snail control:

" 1. Information concerning the characteristics of the snail life-cycles indicates that:

(*a*) it may be most favourable to treat after reflooding of a dried habitat, since reproduction of pulmonate vectors is generally rapid at that time, the population is small and the snails may be immature;

(*b*) the great reproductive potential of the pulmonate vectors means that treatments may have to be very frequent and that repeated checks at close intervals may have to be made to ensure effective control;

(*c*) not all current molluscicides kill the eggs at usual concentrations, and repetition of treatment may therefore be necessary;

(*d*) since *Oncomelania* is more susceptible to molluscicides when it is in its young aquatic phase, treatment should be made when reproduction is active.

2. Information concerning snail habits and characteristics indicates that:

(*a*) in the case of snails resistant to drying, treatment at other than maximum water-level may miss some snails, and stream clearance should not precede treatment since it removes snails from exposure but may not kill them;

(*b*) in the case of snails not resistant to drying, the water-level at the time of treatment is not so important, and the application may be made before the water has reached its maximum level with a consequent saving of chemical;

(*c*) burial of snails in soft mud may protect them against some chemical agents;

(*d*) snails may avoid the action of molluscicide by emerging from the water or penetrating into the mud, and the ecological conditions under which such escape reactions may take place need to be further studied.

3. Information concerning conditions of habitats indicates that:

(*a*) substances in the water may affect the action of the chemical. For example, organic matter binds copper, and silt interferes with the molluscicidal action of both copper and sodium pentachlorophenate;

(*b*) vegetation and irregular margins may impede the distribution of soluble chemicals;

(*c*) since flowing water will carry away the chemicals, further amounts will have to be added over a period of time, and the concentration during that period will have to be measured."

Observations on the establishment of breeding colonies of bulinid and planorbid snails in irrigation systems in various parts of the world have led to the development of some engineering control measures which may be expected to limit or reduce snail populations. Among these may be mentioned: clearance of weeds, covering of channels or piping of irrigation water, and drainage and lining of irrigation canals.

" The development of ecological research has now reached a point at which extensive field studies can no longer be efficiently carried out by individuals, and co-operation between specialists in different scientific disciplines is desirable."

Notes and News

Rural sanitation in northern Greece

In many areas of the world improved sanitation is a prerequisite if the public health programmes which have been planned are to prove successful. WHO's work on environmental sanitation is largely concentrated on the improvement of rural sanitation, training of sanitation personnel, the development of administrative organizations, and the dissemination of information. With regard to the development of rural sanitation an important project under execution in 18 Greek villages situated in eastern Macedonia affords a good example of the way in which the Organization assists a country in a sanitation programme.

The agreement signed in 1955 between the Greek Government, WHO, and UNICEF for sanitation work in these 18 villages had the following principal aims:

(1) To provide safe and adequate water supplies to the populations concerned, especially to centres serving children, such as schools and children's homes;

(2) To provide satisfactory and hygienic means of disposal of excreta and other wastes;

(3) To undertake a campaign of health education to ensure proper use of the facilities provided and to encourage self-help;

(4) To train the technical workers concerned in the programme by special courses and by fellowships.

The responsibilities of WHO in this plan were to give technical advice on the execution of the projects as required, to provide consultants to help with the courses of instruction and to award fellowships for study abroad. UNICEF agreed to supply the pipes and fittings required for the water supplies (the total length of pipes being about 24 miles), while the Greek Government undertook to supply the necessary personnel, to provide transport and other materials, such as cement and steel, and to meet the other expenses of the programme.

Work on the project started in the summer of 1955, and the UNICEF supplies began to arrive in Greece in February 1956. In April and May 1956, two consultants were sent by WHO to Greece to assess the conditions in the villages, to report on the progress of the scheme and on the delivery and distribution of the UNICEF supplies and to organize in Salonika a course of training for the various workers engaged. This was an intensive course of one week's duration, which had a total attendance of 136, including doctors, engineers, sanitary inspectors, veterinarians, midwives, health visitors, and the directors of the children's homes and maternal and child health centres. It was

followed by a series of one-day conferences held in four local centres, which were attended by the presidents and councillors of the communities included in the scheme, schoolteachers and others. These conferences were devoted to arousing public interest and co-operation in the work.

Reporting on the progress made with the water supplies, one of the WHO consultants stated that although most of the village schemes consisted simply of a mountain spring, an aqueduct, a reservoir, and a distribution system serving a number of points in the village streets, with no treatment of the water, they had been carefully prepared on sound engineering lines. It was felt that if these water systems were well constructed and properly used they would ensure safe and in most cases reasonably adequate water supplies to the villages. Substantial progress has been made in most of the 18 villages. Work already completed includes the construction of spring structures, reservoirs, and water points, the excavation of pipe trenches, and in some cases pipelaying. Other aspects of the project such as excreta disposal, latrine construction, and health education are also receiving attention.

It is anticipated that the present programme of work will be substantially completed by July of this year, but if necessary work will continue beyond that date.

Directory of dental schools

The Director-General of WHO has recently sent a letter to all Member States informing them that the Organization is now collecting information on dental education from all countries with the aim of publishing a *Directory of Dental Schools*. So that WHO can have at its disposal accurate and complete information the Director-General asks that full details of dental education, including a list of faculties, schools, or colleges of dentistry, should be furnished by the respective countries. Attached to the letter is a guide outline which lists a number of questions on dental education which WHO is interested in having answered.

Malaria advisory teams

A recent innovation in WHO's programme of assistance to governments in the eradication of malaria is the establishment of WHO malaria advisory teams for survey work in the field. At present three teams are operating, two of them providing expert advice on national antimalaria programmes, and the third, to which reference is made on page 133 of this issue, concentrating its activities entirely on a study of the *Anopheles gambiae* problem in Africa. The latter team, which is known as the *A. gambiae* Research and Advisory Team, has a different organization and a more limited field than the two general advisory teams.

The advisory teams visit countries at government request and through their field work study at first hand the progress being made. The main objectives are to give guidance to governments on the possible conversion of existing antimalaria programmes to eradication programmes, or, if eradication work is already in progress, to give expert advice on how it can best be conducted in the future. Each advisory team consists of a malariologist, acting as team leader, an entomologist and two laboratory technicians. The team is self-sufficient as regards transport, laboratory equipment and supplies. These advisory teams spend practically all their time in the field where they make spot surveys (malariometric, epidemiological, and entomological) and investigate any special problems. They also make a careful study of data already available. Before any actual recommendations are made a leading consultant malariologist is sent by WHO to the team's headquarters in order to discuss the findings with the team leader and the entomologist; correlate these with existing local data, and on that basis give pertinent advice to governments.

The advisory teams have already completed two assignments. The first, in Iran, lasted for four months and was completed in November 1956. The eradication phase has been reached in Iran and the team's attention was mainly focused on surveillance. In addition a special study was made of ano-

pheles resistance to insecticide. Resistance to DDT was confirmed in one species and evidence of it found in another.

The second completed mission was in Afghanistan where an advisory team made a three-month stay at the end of 1956. As there was a planned change from control programmes to eradication in Afghanistan the principal work for the advisory team was to determine those areas in which spraying operations could be brought to an end.

Both advisory teams have now taken up new assignments. The first team is at present in Taiwan, where it is now completing its work before going on to the Philippines early in June for a further four-month mission. The second team has been at work in Ceylon for the past four months. Eradication in that country is well advanced and the question of surveillance is now uppermost.

USSR resumes active participation in WHO

The Government of the Union of Soviet Socialist Republics has informed Dr M. G. Candau, Director General of WHO, of its decision to resume active membership in WHO this year. The USSR became a Member State in March 1948 but discontinued active participation in February 1949. Albania, Bulgaria and Poland have already announced their resumption of active participation in WHO.[1]

Malaria control in Taiwan

The report of the Malaria Conference for the Western Pacific and South-East Asia Regions, held in Baguio, Philippines in November 1954 (issued in the *World Health Organization: Technical Report Series* No. 103) gave details of the labour employed on malaria control programmes in various Asian countries. It has been pointed out that under the heading China (Taiwan) in the table reproduced on page 23 of the report the 159 foremen or squad leaders, the 636 skilled labourers and spraymen, and the 308 unskilled labourers were actually employed for a period of only 60-75 days.

Expert Committee on Food Additives

The increase in the number of chemicals used or proposed for use in foods in recent years has imposed on public health authorities and other governmental agencies the heavy responsibility of deciding whether or not these substances should in fact be employed. The Joint FAO/WHO Expert Committee on Food Additives, which held its first meeting in Rome in December 1956, considered that safety for use must be the most important consideration in making such decisions. This group stated that, while it is impossible to establish absolute proof of the non-toxicity of a specified use of an additive for all human beings under all conditions, critically designed animal tests of the physiological, pharmacological, and biochemical behaviour of a proposed additive can provide a reasonable basis for evaluating the safety for use at a specified level of intake.

In view of this the Committee recommended that a further session should be held to discuss procedures for the toxicological testing of food additives. FAO and WHO have given effect to this recommendation by calling a second meeting of the Joint Expert Committee, to be held in Geneva from 17 to 24 June 1957. This group will discuss procedures for the determination of acute and sub-acute toxicity, chronic toxicity, and possible carcinogenic effects. The place of metabolic and biochemical investigations in determining safety for use will also be considered, as well as the interpretation of the toxicological data in terms of man, and the safety factors which should be employed.

The following experts have been invited to attend: Professor E. Abramson (Sweden), Mr M. G. Allmark (Canada), Dr J. M. Barnes (United Kingdom), Dr R. Blackwell Smith, jr (United States of America), Dr F. A. Denz (New Zealand), Professor A. C. Frazer (United Kingdom), Dr H. van Genderen (Netherlands), Dr B. Mukerji (India), Dr Howard Spencer (United States of America), Professor R. Truhaut (France).

[1] *Chron. Wld Hlth Org.*, 1957, **11**, 51

Sanitary airports

A recently-published Supplement to the WHO *Weekly Epidemiological Record* (No. 10 Suppl. 2) contains up-to-date information on sanitary airports, and on airports with direct transit facilities, in a large number of countries and territories throughout the world. The International Sanitary Regulations define sanitary airports as those which have, *inter alia*, an organized medical service with adequate staff, equipment, and premises. Airports with direct transit facilities are those with special accommodation for the segregation and medical supervision of passengers and air-crews breaking their journey without leaving the airport.

Also published in the Supplement are the names of airports in Ceylon, Mexico, and the Union of South Africa designated for the landing of aircraft coming from yellow-fever-infected areas.

Drug addiction and drug habituation

The need for a clear distinction between drug addiction and drug habituation was a question given detailed consideration in the recently-published seventh report of the WHO Expert Committee on Addiction-Producing Drugs.[1] The Committee was of the opinion that the two expressions *addiction-producing* and *habit-forming* were still too commonly used interchangeably. In reviewing the definitions and clarifications of addiction-producing and habit-forming drugs already published in the Committee's second [2] and third [3] reports it was felt that the time was opportune to emphasize once again the distinction between addiction and habituation and the necessity of strict application of the terms *addiction-producing* and *habit-forming* that " there may be appropriate warning in both instances on labels and in all literature, so that the occurrence of abuse may be watched for and guarded against ". The Expert Committee therefore adopted the following definitions, that for drug addiction being substantially the same as the one given in the second report of the Committee, and that for drug habituation being new:

Drug addiction

" Drug addiction is a state of periodic or chronic intoxication produced by the repeated consumption of a drug (natural or synthetic). Its characteristics include: (1) an overpowering desire or need (compulsion) to continue taking the drug and to obtain it by any means; (2) a tendency to increase the dose; (3) a psychic (psychological) and generally a physical dependence on the effects of the drug; (4) detrimental effect on the individual and on society."

Drug habituation

" Drug habituation (habit) is a condition resulting from the repeated consumption of a drug. Its characteristics include: (1) a desire (but not a compulsion) to continue taking the drug for the sense of improved well-being which it engenders; (2) little or no tendency to increase the dose; (3) some degree of psychic dependence on the effect of the drug, but absence of physical dependence and hence of an abstinence syndrome; (4) detrimental effects, if any, primarily on the individual."

UN Advisory Committee at WHO Headquarters

In response to an invitation from the Director-General of WHO the United Nations Advisory Committee on Administrative and Budgetary Questions paid a visit to WHO Headquarters between 25 March and 5 April for the purpose of holding consultations with WHO officials on administrative and budgetary co-ordination between the United Nations, WHO, and the other Specialized Agencies.

The Advisory Committee, which is one of the standing committees of the UN General Assembly, consists of nine experts appointed in their individual capacities by the General Assembly. The Chairman of the Committee, Ambassador T. Aghnides of Greece, has held this position since 1946.

[1] *Wld Hlth Org. techn. Rep. Ser.*, 1957, 116
[2] *Wld Hlth Org. techn. Rep. Ser.*, 1950, 21, 6-7
[3] *Wld Hlth Org. techn. Rep. Ser.*, 1952, 57, 9

During the course of the session—the first to be devoted exclusively to WHO affairs at the Geneva headquarters—the Advisory Committee paid particular attention to the administrative workings of the technical assistance programme and its relation to the total programme of WHO. In general, the Committee's work was aimed at ensuring that administrative operations of the United Nations and the Specialized Agencies were carried out in the most efficient and economical manner possible and that co-ordination and uniformity were secured wherever feasible.

Supply of rabies reference vaccine

Because of the loss in potency which may occur in rabies vaccines produced, stored and used under different climatic conditions and circumstances, it is essential to perform stability tests in order to determine the duration of antigenicity. In the USA the National Institutes of Health supply ampoules of a Reference Vaccine (155D) to laboratories which produce rabies vaccine so that they may perform potency tests which have a comparable basis. It was recognized at the third session of the WHO Expert Committee on Rabies, which met in December 1956 in Paris, that " it would be desirable for national laboratories to prepare their own stock of a reference vaccine which, after comparison with the Reference Vaccine 155D, could be used to supply routine production laboratories within a country ". However, since Reference Vaccine 155D is an ultraviolet-light-inactivated dried product, its production can only be undertaken at the present time in relatively few countries. WHO maintains at the Department of Biological Standardization, Statens Seruminstitut, Copenhagen, a small stock of Reference Vaccine 155D, kindly made available by the National Institutes of Health, and will supply, upon request, ampoules to national laboratories wishing to prepare their own Reference Vaccine; or, so far as its stocks permit, reasonable quantities of the Reference Vaccine for the performance of routine potency tests on large batches of vaccine. Requests should be made directly to the Statens Seruminstitut in Copenhagen. The use of Reference Vaccine 155D for these purposes is described in the WHO monograph *Laboratory Techniques in Rabies* (Wld Hlth Org. : Monogr. Ser. No. 23).

Survey tour by French author

Pierre Gascar, the well-known French writer whose work *Le Temps des morts* was awarded the *Prix Goncourt* in 1953, recently concluded a reconnaissance tour through countries of Asia, Africa, and the Pacific region.

His four-month journey—made by air, jeep, on muleback and on foot—took him to India, Thailand, the Philippines, Indonesia, Malaya, Ethiopia, and Sudan; and in each of these countries he shared the day-to-day life of their health teams, which are engaged in fighting such major human scourges as malaria, leprosy, yaws, and tuberculosis.

Mr Gascar has thus had a unique chance to observe and gather material on various phases of the world-wide operations that have taken shape in the under-developed areas of the world since the inception of the World Health Organization, each designed to the same end—the betterment of man's health and well-being. He has seen at first hand the tremendous efforts being made by governments, with WHO's help, to overcome the pressing health problems that must first be brought to manageable proportions before progress in other directions can attain fuller measure.

The material collected by Mr Gascar is to be incorporated in a book, which will probably be published commercially in 1958 to coincide with the tenth anniversary of WHO.

Malaria eradication in the Americas

It has been estimated that there are some eight million cases of malaria yearly in the Americas. Because of the gravity of this

problem, the definitive solution—eradication of the disease—has been given first priority in the public health work of the Pan American Sanitary Bureau (PASB), which acts as WHO Regional Office for the Americas. As the co-ordinator of international health work in the Americas, the PASB has established technical standards essential for malaria eradication, and is helping national health services to make these standards known, accepted, and applied in the eradication programmes of the various countries.

Since the beginning of the year approximately one million houses have been sprayed in the malarious areas of the Region out of an estimated total of five million which must be reached before continental eradication of malaria can be achieved. However, with the possibility of the development in vectors of resistance to the residual insecticides it is of first importance that eradication should be completed as soon as possible. Therefore, the need for the early establishment of full-scale national eradication programmes, in addition to those already initiated, is pressing. Standard eradication procedures are now being developed by the various national health services, as rapidly as the availability of funds and of technically trained personnel permit.

The funds available to the Pan American Sanitary Organization for malaria eradication have recently been increased by a contribution of $100 000 from the Dominican Republic—the first instalment of a pledged donation of $500 000. The Government of the United States of America has already made a contribution of $1 500 000.

Technical conference on insect resistance

The principal technical impediment to success in the control or eradication of vector-borne disease is insecticide-resistance. It is a problem which, in the view of the WHO Expert Committee on Insecticides, has been growing much more rapidly than measures to deal with it. This fact led the Expert Committee at its seventh meeting to recommend that WHO should assume leadership in the stimulation and co-ordination of an international research programme on the resistance problem.

In line with this recommendation WHO has convened a Technical Conference on Insect Resistance which will be held in Geneva between 25 and 31 July 1957. The meeting, which will be attended by directors of laboratories, will devote its attention primarily to discussions on the implementation of a programme for the co-ordination and stimulation of research on insect resistance. It will also consider what lines of research are necessary to formulate countermeasures against resistance, suggest ways and means of bringing about a greater concentration of effort on the problem, and study future needs in technical personnel and equipment. The following will participate in the conference: Dr A. L. Berti (Venezuela); Dr D. Dresden (Netherlands); Dr R. A. E. Galley (United Kingdom); Dr J. Hamon (France); Dr H. Laven (Germany, Federal Republic); Dr A. W. Lindquist (United States of America); Professor G. MacDonald (United Kingdom); Dr E. Mosna (Italy); Mr K. D. Quarterman (United States of America); Dr A. A. Shawarby (Egypt); Lt. Col. Jaswant Singh (India).

Mental health and atomic energy

WHO is convening a study group on the subject of the mental health aspects of the peaceful uses of atomic energy, which will meet from 4 to 9 November 1957. The preparatory work for this meeting will be in the hands of Dr Kenneth Soddy, of the United Kingdom, who has been specially recruited as a consultant for this purpose.

The task of the study group is to determine whether the increased use of atomic energy for peaceful purposes has brought in its train any mental health problems and, if so, to investigate the nature and extent of these problems and to suggest scientific ways and means of dealing with them.

Interesting material for study has been brought to light by preliminary investigations already made. Scientists generally agree that the present danger to human

health and happiness from properly-organized atomic energy projects is negligible. Nevertheless, apprehension still exists and has been freely ventilated in the press. Of all alleged medical and health hazards that of danger from radiation is the one that has given rise to the greatest anxiety. Indeed, plans to establish nuclear energy plants sometimes meet with local opposition.

Official reassurances on this matter may not be entirely effective, due partly to the fact that the scientific aspects have not as yet been subjected to investigation. The public is accordingly not disposed to accept assurances based on a denial of the existence of any problem.

The possible cumulative ill-effects of radiation applied in medical therapy is another matter of concern. Public controversy has drawn attention to the surprising fact that the anxiety or fear that is often engendered in patients subjected to such treatment, due partly to the dread nature of the diseases involved and partly to the impressive character of the apparatus and techniques used, has as yet received scant scientific investigation. It is generally recognized that an anxiety state impairs both resistance to disease processes and the capacity to recover, yet it has been left to the intuition and goodwill of the radiologist to try to allay the patient's apprehensions and instil in him the will to recover, without which medical science may prove unavailing. Problems of this kind will figure among the many questions to be examined by the study group.

Dr Soddy is in charge of child psychiatric work at University College Hospital, London. He is also a lecturer in the Medical School and in the Department of Psychology of University College. In addition, he holds the post of Medical Director of the Child Guidance Training Centre, London, where professional training is provided for post-graduates. He has had extensive experience of mental health work at the international level in his capacity of Assistant Director of the World Federation for Mental Health, a position he has held since the inception of that body in 1948. He is therefore particularly qualified for preparing the ground for investigation into this hitherto unexplored sphere.

In the next few months, Dr Soddy will be assembling information from atomic energy plants, hospitals, and wherever else atomic energy is in use, on the human and social aspects of the problem. Further enlightenment will be sought in scientific writings, popular literature and the press, to determine how the irrational hopes and fears in regard to atomic energy are being treated. This information will be collated to form a basis for the study group's work.

Dangers of tranquillizing agents

The increasing use made by the public of certain so-called "tranquillizing" agents has prompted the WHO Expert Committee on Addiction-Producing Drugs to publish a warning on their possible effects. Commenting on the habit-forming propensities of these drugs the Committee's seventh report [1] says: "Many authorities have expressed the view that all drugs which are used therapeutically for a central sedative or tranquillizing effect, to promote sleep or to relieve anxiety, may be habit-forming. Some drugs which are used for a central stimulating or exhilarating effect may also be habit-forming. With both types, the essential factor presumably is improvement in the sense of well-being. Habituation with these agents is not primarily or essentially an abuse, except that it may lead to unduly prolonged or excessive administration not related to symptomatic relief. Such excessive administration may result in physical dependence and development of a true addiction. With the barbiturates, for example, Fraser and his associates [2] have established that there is a critical dosage level for some barbiturates above which definite addiction with all of its characteristics is demonstrable. Whether this is so for sedatives generally is not known, but the possibility of their producing habituation should be recognized and becomes of greater

[1] *Wld Hlth Org. techn. Rep. Ser.*, 1957, **116**, 13
[2] Fraser, H. F. et al. (1956) *Fed. Proc.*, **15**, 423

and greater importance with the widespread and ever-increasing use of the so-called 'tranquillizing' agents."

International rabies reporting

The present unsatisfactory situation with regard to rabies reporting led the WHO Expert Committee on Rabies to make the following recommendation in its third report: [3]

"The necessity of prompt reporting of rabies within a country for national control purposes has been stressed previously by the Committee. For international purposes it is important that information of the current status of rabies in countries throughout the world be made available. The Committee strongly recommends that such information be supplied to WHO periodically, preferably every six months, so that this information would be available for Member States.

"In the past, rabies statistics have often been difficult to interpret because of gaps of information on various aspects of the disease in places where post-exposure treatment is given. The Committee recognizes that detailed information forms are often used, but these frequently defeat the purpose for which they are intended because of reluctance to fill out all the details requested in such forms. A simplified form is therefore suggested which covers the principal items in connexion with suspected rabies exposure in human beings. The Committee recommends the use of this, or of a similar, form to rabies authorities."

Death of Dr Raymond Gautier

The news of the death of Dr Raymond Gautier, a former Assistant Director-General of WHO in charge of the Department of Central Technical Services, has been received with regret. Dr Gautier had participated in the work of WHO since the establishment of the Interim Commission in 1946. In the course of a long career in international work, which started in the Health Organisation of the League of Nations in 1924, Dr Gautier specialized in the field of biological standardization. Between 1926 and 1930 he occupied the post of Director of the Eastern Office of the League's Health Organisation at Singapore.

On reaching retirement age Dr Gautier left WHO in 1950 and thereafter became Research Director for the International Children's Centre in Paris. A full account of Dr Gautier's career was published in the February 1950 issue of the *Chronicle*.

Death of Dr Gérard Montus

Dr Gérard Montus, Deputy Director of the WHO Regional Office for Europe, died in Geneva on 21 April 1957 after a long and painful illness. His death will be deeply regretted by all his fellow workers and by his many friends in the field of public health.

Dr Montus was born at Carry-le-Rouet near Marseilles in 1902 and graduated in medicine at the University of Montpellier. He continued his studies at the Pasteur Institute in Paris and at the University of Paris, where he took a degree in public health. For some time he was in charge of the Children's Clinic of the University of Marseilles. Later he was Departmental Director and then Regional Director of Health at Marseilles, and Director of Child Health at the Ministry of Health in Paris.

Dr Montus served as a member of several French delegations to the World Health Organization and its Interim Commission. He joined the Organization in 1949, serving first as European Regional Adviser on Maternal and Child Health and later as Chief of the Headquarters Social and Occupational Health Section.

In 1952 he was appointed Deputy Director of the Regional Office for Europe where his energies were principally devoted to programme planning. In 1956, on the death of Dr Begg, Regional Director, Dr Montus took over the direction of the Office until he, in turn, was overtaken by illness.

[3] *Wld Hlth Org. techn. Rep. Ser.* 1957, **121**

Death of Dr Thorvald Madsen

The death of the distinguished Danish bacteriologist, Dr Thorvald Madsen, has just been reported from Copenhagen. Dr Madsen, who was 87 years of age, took his M.D. from Copenhagen University. In 1902 he was appointed Director of the Statens Seruminstitut and did not relinquish this post until 1940. Dr Madsen's international experience started in the First World War, when he worked for the Red Cross. In the inter-war years he became active in the League of Nations and between 1921 and 1940 was President of the League's Health Committee and its Commission on Biological Standards. The work of both bodies received world-wide recognition and this success was due in large measure to the untiring efforts of Dr Madsen. The important work initiated by the two committees under his presidency is now being carried on by WHO.

Following the end of the Second World War Dr Madsen served for three years as Head of the UNICEF Mission to Italy. Dr Madsen's death will be deeply regretted by public health workers throughout the world as he was generally acknowledged to have been one of the pioneers of international health work.

People and Places

WHO Headquarters Appointments and Departures

Dr Willem Aegidius Timmerman, of the Netherlands, has recently been appointed Assistant-Director-General in charge of WHO's Central Technical Services. Dr Timmerman took his M.D. at the University of Leiden in 1918 and thereafter pursued a distinguished scientific career in the Far East and in the Netherlands, specializing in bacteriology, biological standardization, and the control of pharmaceuticals. From 1928 to 1931 Dr Timmerman worked in the Pasteur Institute in Java, and later was appointed Director of the State Institute for Public Health in the Netherlands, a post which he held until 1950, when he joined WHO as Director of the Division of Therapeutic Substances.

In his new post Dr Timmerman will be particularly concerned with the work of the Divisions of Epidemiological and Health Statistical Services, Therapeutic Substances, and Editorial and Reference Services.

* * *

M. Jean Brouland, formerly Administrative and Finance Officer of the WHO Regional Office for South-East Asia, has been appointed Chief of Personnel at WHO Headquarters and took up his new duties during May. M. Brouland succeeds Mr John Armstrong who, as already announced in the *Chronicle*, became Director of the Division of Administrative Management and Personnel on 1 April.

* * *

The Director-General of WHO recently announced the resignation of Dr Marcelino Pascua, who has left the Organization to become Director of the Centro Latino-Americano de Entrenamiento e Investigaciones en Demografía (Latin American Centre for Training and Research in Demography), in Santiago de Chile. Dr Pascua took up his new duties there on 17 April 1957.

Coming to WHO from the Johns Hopkins University, Baltimore, Md., where he had been Assistant Professor of Biostatistics and Epidemiology, Dr Pascua joined the secretariat of the WHO Interim Commission on 1 February 1948 as a Statistical Expert. Before entering university life in 1939 he had had a distinguished career in national and international health work.

In September 1948 Dr Pascua was appointed Chief of the Health Statistics Section, and in 1950 became Director of the Division of Health Statistics. In January 1953 he was made Director Consultant on Health Statistics in order to assist in the development of national health statistical services.

* * *

Mr Prescott A. Stevens, of the United States, has been transferred to the Malaria Section at WHO Headquarters for service as a public health engineer, after six years spent in work on the WHO-assisted malaria and insect-borne diseases control projects in Iran. His particular duty will be to advise on the administrative and organizational aspects of malaria eradication programmes, a task for which his earlier experience in the field has fitted him well.

Mr Stevens holds the degrees of bachelor of science in civil engineering from the Worcester Polytechnic

Institute, Worcester, Mass. and master of science in sanitary engineering from Harvard University. Prior to joining the WHO staff, he was for a year an area hygiene officer with the Italian Field Office of the International Refugee Organization.

Malaria Field Appointments

WHO's extensive work towards the ultimate eradication of malaria goes on apace. The two special advisory teams set up last year (see Notes and News, page 167) have already completed two assignments, in Iran and Afghanistan, and are now at work in Taiwan and Ceylon. The team in Taiwan is headed by Dr M. E. Farinaud, who took over the leadership from Dr J. de Zulueta, of the WHO Headquarters staff. Dr Zulueta was temporarily assigned to this work in Iran. Mr P. Jolivet is the entomologist of the team and Mr K. Thymakis and Mr P. Caprari are the laboratory technicians. The second team, of which Dr S. Avery Jones is the leader, reached Ceylon in February of this year. Dr W. W. G. Buttiker is the entomologist and Miss Luela Lowy and Mr P. F. Beales, the laboratory technicians. Dr Avery Jones came to this work from his previous WHO assignment in Liberia.

Taiwan and Ceylon are in the later stages of malaria eradication. The attention of both teams is focused on the working of the surveillance system and the study of the main malaria vector.

Mr J. C. Vedamanikkam, of India, an entomologist, is another new recruit to WHO's work in this domain. He has joined Dr S. Roy Chowdhury in the WHO-aided project now in operation in Sudan. Mr Vedamanikkam, a graduate of Madras University, was formerly chief entomologist of the Public Health Service of the Government of Madras. From 1950 to 1952, he served as the government (counterpart) entomologist with the WHO-assisted malaria project in Ernad, South India. Mr M. F. Gohar, of Egypt, who has been on the WHO staff since 1952, first with a cholera project in East Pakistan and subsequently with malaria projects in Saudi Arabia and Syria, has recently been transferred to this same project, to act as sanitarian.

Professor G. Livadas, of the Athens School of Hygiene, who has once again joined the WHO staff, will now act as malariologist-consultant for the malaria pilot project now in progress at Yaoundé in the French Cameroons. Professor Livadas was for some time the WHO Regional Adviser in South-East Asia and he has also served the Organization as a consultant on a number of occasions. He was Chairman of the 1956 meeting of the WHO Expert Committee on Malaria. His task in Yaoundé is to study the position reached in the present operations, which have been going on for some years past, and to advise on the future conduct of the work against malaria in the French Cameroons.

Burma's malaria eradication programme has recently been strengthened by the transfer there of Mr Sankaranarayana Sundararaman, of India. Mr Sundararaman is an entomologist who has been working for the last three-and-a-half years with the WHO-assisted project in Indonesia.

Dr P. C. Issaris, of Greece, who has served with WHO since 1949, has arrived in Liberia, where he is to advise the Government on the future development of antimalaria work in that country. Dr Issaris has previously acted as leader of the WHO/UNICEF-assisted project in Uttar Pradesh, North India, and as senior adviser of the project in Indonesia. On completion of his assignment in Liberia, he will be taking over from Dr Farinaud the leadership of the malaria advisory team now in Taiwan, which is next scheduled to visit the Philippines.

The staff of the WHO malaria co-ordination office for the Eastern Mediterranean Region, Alexandria, has just been strengthened by the appointment of Mr H. A. Rafatjah, of Iran, who has recently taken up duties as a public health engineer there. Mr Rafatjah, who is Chief of the Malaria Eradication Division of the Iranian Ministry of Health, has been given leave from his duties for a period of two years to undertake this work. He will be joining forces with Dr M. A. Farid, the WHO Regional Malaria Adviser, in developing eradication campaigns in the area.

Mr Rafatjah was educated at the University of Teheran and the Institute of Malariology in Rome; subsequently he studied public health engineering in the United States, at the Universities of Minnesota, Ohio State, and Emory University, Atlanta, Ga.

Sudan Tuberculosis Centre

Mr Andrew N. Ruane, of Ireland, is the latest member of WHO to join the staff of the Tuberculosis Demonstration and Training Centre, at Wadi Medani, Sudan, where he has just taken up a post as laboratory technician. The Centre, which is soon to be opened, has been organized by the Sudanese Ministry of Health, with financial assistance from the United Nations Technical Assistance Board and technical help from WHO. Its functions are to investigate the extent of the tuberculosis problem in Wadi Medani and eventually throughout the Blue Nile Province, to develop methods appropriate for controlling the disease there, and to train personnel so that the service may be extended to other parts of Sudan.

Leading Leprologist Appointed

WHO has secured the services of one of the world's acknowledged leading leprologists, Dr Robert G. Cochrane, of the United Kingdom, to assist in reviewing the present position in regard to leprosy immunity, with particular reference to the possible efficacy of BCG vaccination as a preventive agent.

Dr Cochrane has had long world-wide experience in leprosy work. At present he holds the post of Technical Medical Adviser of American Leprosy Missions, with headquarters in London, and he is also adviser on leprosy to the Ministry of Health. His varied career has included many other consultant posts, notably, that of adviser to the Government of India. Dr Cochrane is a member of WHO's Expert Advisory Panel on Leprosy. He took a leading part in introducing the use of the drug, diamino-diphenyl-sulfone, in leprosy therapy—a development which has brought new hope to sufferers all over the world.

Public Health Adviser Visits Pakistan

The Eastern Mediterranean Regional Office of WHO recently despatched its Public Health Adviser, Dr Leo Kaprio, to Pakistan for the purpose of consulting with the Pakistan Government on future health programmes in that country and of visiting the WHO-aided field projects now in operation there. The activities assisted by the Organization cover many aspects of public health work and include, notably, the Maternal and Child Health Demonstration and Training Centres in Karachi and Dacca; nursing projects in the same two cities; venereal diseases control project in Chittagong; country-wide BCG vaccination campaign; the Children's Hospital in Karachi; assistance to medical schools and to the schools of sanitary engineering and physiotherapy of West Pakistan.

Assistance to Educational Institutes

The Institute of Hygiene of the University of the Philippines is to receive assistance in the form of a visiting lecturer in biostatistics, under a joint undertaking of WHO, the Johns Hopkins University, Baltimore, Md., and the University of the Philippines. The Rockefeller Foundation is also participating.

Dr Matthew Tayback, of the United States of America, is to be granted leave of absence from his post of Director of the Statistical Section of the Baltimore City Health Department for this assignment, which begins on 1 July 1957 and will last for three months.

Environmental Sanitation

Mr Max L. Roy, of Haiti, has recently been assigned to the staff of a WHO team which is now at work in Iraq. Mr Roy is a public health engineer and his duties will be to assist in establishing and developing in Dyala Liwa a model provincial health department, integrated with the existing medical services. Administrative and technical procedures are to be tested and proved, with a view to their adoption in other provinces of the country. Mr Roy will also be engaged in setting up a practical rural training area for various types of health personnel. Prior to joining the WHO staff in December 1953, Mr Roy had had a lengthy experience in his own country in public health engineering and, notably, in rural sanitation work. In an earlier assignment with WHO, he advised the Ministry of Public Health of Afghanistan on the setting up of a sanitary engineering programme for that country.

Organization of Public Health Services

Dr Ernesto J. de Oliveira, of Portugal, has recently been appointed by WHO to serve as a medical officer. He has been assigned to La Réunion and will shortly be arriving there to take up his duties as team leader of the WHO-assisted project now operating in the island. This team of WHO public health staff is assisting the governing authorities, in response to a request for help, in making a general health survey of the island with a view to drawing up an effective programme for improving its health situation.

La Réunion, situated in the Indian Ocean east of Madagascar, is a Department of France, with a population of about 260 000.

Dr de Oliveira received his medical training at the University of Oporto, and recently took his diploma in tropical medicine and hygiene at the London School of Hygiene and Tropical Medicine. He worked as a public health officer with the United Nations Korean Reconstruction Agency from 1952 to 1955, after having served for five years in his national health services.